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NOMINATION—NASA

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HEARING

BEFORE THE

COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION UNITED STATES SENATE

NINETY-NINTH CONGRESS

SECOND SESSION

ON

APRIL 23, 1986

JAMES C. FLETCHER, TO BE ADMINISTRATOR, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

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Committee on Commerce, Science, and Transportation

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JAMES FLETCHER TO BE ADMINISTRATOR, NASA

WEDNESDAY, APRIL 23, 1986

U.S. SENATE,
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,
Washington, DC.

The committee met, pursuant to notice, at 3:10 p.m., in room SR-253, Russell Senate Office Building, Hon. Slade Gorton, presiding.

Staff members assigned to this hearing: Macky Ayers, Pete Perkins, professional staff members; and Marty Kress, minority professional staff member.

OPENING STATEMENT BY SENATOR GORTON

Senator GORTON. Welcome to this hearing of the Committee on Commerce, Science, and Transportation as it considers the nomination of Dr. James Fletcher to be Administrator of the National Aeronautics and Space Administration.

The nomination of Dr. Fletcher is long awaited and sorely needed. Unquestionably, NASA is faced with its most challenging and demanding task since its creation in 1958. For an agency whose charter expects it to focus most of its energies and resources toward space exploration, NASA has been put in the frustrating and uncomfortable position of being held, if you will, captive on Earth.

Dr. Fletcher's challenge and that of NASA is to reconstitute our space launch capability, to reestablish NASA's presence in space, and to set our Nation's Space Program on a path to the 21st century.

This will not be an easy challenge. Our Nation's will and resolve are now being tested and viewed by the world under a microscope. Whether or not we step up to this challenge will send a signal the world over as to the priority we place on our Civil Space Program.

To direct my comments now to a more tangible, quantifiable and more equally meaningful level of discussion, I bring attention, as Senator Riegle did this morning at the NASA authorization hearing, to the disturbing article that appeared in the New York Times today. That article described a litany of practices over a period of many years which gives the appearance of waste, fraud, and mismanagement within the agency. Worse yet, the article describes in some cases an arrogant disregard for some of the problems even after they were brought to NASA's attention.

While it is not the purpose of this hearing to pass judgment on the content of the newspaper article or of the audits on which it

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was based, we might be well served to acknowledge the adage, "Where there is smoke, there is often fire." Some of the problems cited in the article may well have been corrected by now. On the other hand, others may have become firmly ingrained in NASA's culture.

Whatever the case, it is incumbent that the new NASA Administrator confront these problems. At a time in which resources are limited and our space program is faced with an exceedingly difficult set of circumstances, the new NASA Administrator must ensure that such problems are not tolerated and that NASA expends its resources as prudently and as efficiently as possible.

I suspect that the timing of the release of this New York Times article was not coincidental. Whether or not the cited problems represent the truth, they nevertheless color this confirmation hearing. We must proceed, however, as planned for there is much work to be accomplished and many decisions at NASA pending this confirmation.

We are fortunate to have before us a nominee who has extensive experience in the aerospace field and in NASA itself. As the fourth Administrator of NASA, Dr. Fletcher guided NASA through its final years of the Apollo Program and through the initial years of the Space Shuttle Program—both experiences which should enhance his already well-proven abilities.

With these thoughts in mind, we, of course, look forward to hearing Dr. Fletcher respond today to some of the questions before us and before NASA itself as we take an important step in that Administration's road to recovery.

Senator Riegle.

OPENING STATEMENT BY SENATOR RIEGLE

Senator RIEGLE. Thank you, Mr. Chairman.

Dr. Fletcher, we have had the opportunity to talk privately before today, and I thought very usefully so, and to cover a number of items, and I will go over some of those again today and perhaps some new ones.

I want to join with the chairman in several of the comments that he has made, certainly acknowledging your history in heading the Space Department or the Space Agency during a very critical time in the past when there were spectacular accomplishments.

I think we are at a new point and I think a lot of work needs to be done. When we spoke before, you evidenced some agreement with that and in fact that was one of the reasons you were willing to step out of the private pursuits that you have been involved in to come back into the Government at this time.

I want to touch on three or four areas at the outset where I have some very real concerns about where we are and how you might see those problems and might be disposed to deal with them.

First of all, I want to also make reference to the New York Times article today because I think it is an important piece and I trust that in the course of your remarks, you will be making some comments about some aspects of it insofar as any conflicts of interests issues in terms of outside activities you have been involved in since leaving NASA.

When we spoke, you indicated to me that it was your intention to sever all of those relationships, dispose of all stock holdings and any business having anything to do with the Government or the Space Program, and if any future decisions were to arise as to a nature that would involve those firms, that you would not take part and insulate yourself in some manner from those decisions.

I take you at your word on that, but you may want to cover some of that in the course of the discussion today because that is a matter of concern, I think, until it is addressed directly by you.

Second, I think the issue of mismanagement or waste problems in the past are carrying over into the present in NASA. Recounted in this article and GAO audits and other audits, I think raised serious questions and I think those need to be addressed and I trust that you are prepared to do so and will do so in due course.

The next area I would like to touch on has to do with the shuttle accident itself and I have to tell you that we never get fully quoted in articles that run on things we say, but I found myself troubled by some of the quotations attributed to you early with respect to the Rogers Commission which I think has worked hard and done a good job, and I think they are objective and arms-length. That does not mean their work is perfect, but it seems to me that they have been working at the fact-finding side of what went wrong, and what needs to be done to prevent problems like this in the future.

I would hope that it would be your intent and that you will address this, that whatever the recommendations are that the Presidential Commission makes, that if you are heading the agency you would be diligent about carrying them out and we would not have any foot-dragging in that respect.

So there may well be differences of opinion, but the President's named the Commission. They are distinguished members. They are working hard, and I must say with respect to that, as I followed that very closely myself, and as I have attended a number of the public hearings of the Commission, it seems to me that we have got some serious problems in NASA, I think reflected in part in the events leading up and even after the *Challenger* accident.

But we have had now three major space accidents in the course of the last 9 months. We have had the explosion last week of the Titan missile carrying a very expensive payload. We lost the *Challenger* with the seven astronauts, and the previous Air Force launch exploded, and over that timeframe I would say that we have lost at least 5 billion dollars' worth of very critically needed national assets, strategic assets if you will, in addition to the loss of life.

As I have been following the work of the Rogers Commission, it seems to me that they have identified four areas of difficulty that need work and correction within NASA and I want to just cite them because I hope again in your comments you will make some reference to these things as you go along.

First, obviously, mechanical difficulties, O-rings, whatever else there may be, but clearly there were problems in this area and there are problems in this area. Some were being worked. The question as to whether they were being worked adequately or not is out on the table, but, nevertheless, it seems clear that some work needs to be done in that area and somebody that is serious about

seeing that it gets done, I think, has to step up to that, presumably yourself in the lead position.

It seems to me the second area of difficulty that the Commission has identified is in management procedures, whether it is launch decisions and the question of signoff procedures and who talks to whom and who does not talk to whom, they have identified serious problems in that area.

In following this thing myself, I am not satisfied with what was done; I do not think the Commission is, clearly from what they have said. I think their report will show that. And so I think there are some very serious procedural reviews that need to be made, and I think changes in response to that.

Third, in the area of personnel, I think there were some management judgments made that were not sound. In the case of the *Challenger* situation, I think that is the clear view of the Rogers Commission, based upon what I have heard them say in public session, and I am troubled about that.

To the extent that that is so, I would hope that we would not see anything of an old boy network operating here because I am sure many of the people involved are friends of yours and associates and people that you have worked with previously, not in all cases, but in some cases, and to the extent that there were misjudgments or poor judgments and some remedy has to be made to that, I think that takes a very strong person to step up to that kind of issue.

And I would hope that you would feel fully able to do that, as painful as you might find it to do, if there is something that needs to be done in that category.

Finally, a fourth area seems to be a more diffuse area that has to do with just pressures bearing in on NASA, whether it be too little money, too much pressure to accomplish too many things in too short a timeframe with new missions coming on.

Whether it has been insufficient oversight by the Congress or by the administration or pressures from the Budget Office, or whether it be ridicule from the press about delays in launches that have combined in some way to take and cause NASA to act in a fashion that has not been sound, then those things have to be laid out and you will have plenty of help in tracking down any and all of these problems from people here, including myself, who feel that we have got to solve these problems and get NASA back on track.

I would just say a couple of other things in that regard. This morning we had a hearing in here on the space station and the Russians are up there with their space station. They are hard at work. We are now planning to have our space station in space, if all goes well, 8 years from now.

So we have got some catching up to do in that area and it seems to me we are going to have to do a lot of things right in the meantime to get ourselves on line.

I want to help you do that, and I think all the members of this committee feel very strongly that NASA, over the years, has had an extraordinary record of success and that we have had people of enormous dedication there in the past. They are there today. They have worked very hard to try to sort out why the *Challenger* accident happened, to try to reconstruct what took place. And I think if they are given the leadership they need, and we have all the

issues laid out on the table, no effort to paper over anything, but to find out where the problems are in any of these categories and fix them, that we can get ourselves back on track and move ahead.

The budgetary pressures under Gramm-Rudman, which is a new fact of life—you had budget pressures before and you were very adroit at dealing with them at the time, in your last time running the agency. We are now under a legal mandate to reduce the Federal budget deficit to $144 billion for the coming fiscal year, then to $108 billion, and then to $72 billion, and that is a very tough, inescapable discipline. So the cost reduction pressure is on everybody.

Having said that, I think we have to spend whatever is necessary to make this program work properly and safely. And so I know you will fight for what you think you need and I think we have to be prepared to step up to that side of the problem, to make sure that we are able to fly again as soon as we safely can and to accomplish these very important missions for the country.

So I will welcome your thoughts and expressions on all of those points.

Senator GORTON. Senator Ford.

Senator FORD. Mr. Chairman, I will forego any opening statement. I would like to get to Jim Fletcher and listen to him a little while. Thank you for the opportunity.

Senator GORTON. Senator Trible.

Senator TRIBLE. Mr. Chairman, I would simply observe that Dr. Fletcher possesses in my judgment the right mix of experience, ability and knowledge, and I believe that he will quickly get things in order and restore a measure of confidence about what we are doing and what we hope to do in the days ahead.

I wish him well and I hope the Senate will move quickly toward confirmation.

Senator GORTON. Chairman Danforth.

OPENING STATEMENT BY THE CHAIRMAN

The CHAIRMAN. Thank you, Mr. Chairman.

I do not believe I have met Dr. Fletcher before this afternoon. If I have, please forgive me for not remembering. I know you only by reputation. I have heard Senator Garn speak of you on a number of occasions. Your reputation is excellent.

There is no doubt in my mind that what NASA needs most now is strong leadership. This is not a job you sought. As a matter of fact, you sought the contrary. But you have answered the call of the President, and I very much appreciate that. I am sure all of us do. We look forward to hearing from you during this confirmation hearing and we look forward to the kind of leadership that we believe you will give this very important agency.

Senator GORTON. Senator Warner has a statement which will be included in the record at this point.

Senator Gore.

OPENING STATEMENT BY SENATOR GORE

Senator GORE. Thank you Mr. Chairman, in many respects, the Space Program, which has been such a source of pride to our country, is at its nadir.

We all well know of the tragedy of the *Challenger* accident, and the sense of loss that has created.

This accident has resulted in revelations which have seriously damaged the image and pride of this agency, and left a number of gaping questions about the future of the agency.

And no sooner had we begun to discuss the possibility of reverting to the fallback position of using more conventional space transportation systems, such as expendable launch vehicles, then we have the events of last Friday, where our front line of ELV's was dealt a blow by the explosion of the Titan 34.

Moreover, we have the revelations from this morning's press accounts, of an agency which pays $80 for a washer, $315 for a 3-cent metal loop, and pays to have its contractors go on publicity junkets for movies. It describes an agency with few or no management or financial controls over either its own employees or its contractors, where project costs balloon out of sight, and with officials whose word cannot be relied upon.

I believe that the next Administrator of NASA will face unprecedented challenges, and will have a tougher job than any Administrator before him, including the first. The future of the American Space Program is at a momentous and treacherous juncture; and without bold, imaginative, and courageous leadership, this effort which has been such a cultural, scientific, and patriotic marvel stands in danger of being ruined. We cannot afford to merely rest on our laurels of the past, but need to make the best of this temporary hiatus in our mission, rethink our goals, refurbish the agency, and restore NASA to its former levels of achievement.

Therefore, Mr. Chairman, I look forward with great interest to Dr. Fletcher's testimony and views about how the Space Program can be put back on its feet.

Senator GORTON. We are now privileged to have here the two most distinguished Members of this body with respect to space to introduce Dr. Fletcher, and we would be delighted to hear from them.

Senator Garn.

STATEMENT OF HON. JAKE GARN, U.S. SENATOR FROM UTAH

Senator GARN. Thank you very much, Mr. Chairman.

It is certainly an honor and a privilege for me to be here today to introduce Dr. Fletcher. As Chairman Danforth indicated, I have known him for a long period of time, for nearly 20 years, when he became president of the University of Utah, and he had a very distinguished career at that time. I think most of you are very well aware that being a president of a major university in the 1960's was not an easy task.

We had the Vietnam war going on, a lot of protest, a lot of great difficulties to solve. The reason that I bring that up is because all of you have indicated we need strong leadership at NASA to overcome the problems that have become apparent over the last few months, and handling that difficult job in such a remarkable way—and unfortunately I was not young enough to be a student when Dr. Fletcher was there. I had graduated some many years before, but I was in city government in Salt Lake and so I had a unique

relationship with the university, to observe the difficulties that were going on during that period of time. And if a college president ever needed leadership, it was during those difficult periods of time.

So it is not just my bias as a Utah Senator or a graduate of the University of Utah, but I would think that you would find in the academic community, almost anyone you wanted to talk to during that period of time, having not only handled it with great leadership and competence and integrity, but built what was a relatively small State university into a major university in a number of fields.

So he not only maintained the status quo, but built the foundations for one of the finer universities in the country and I think it was on that basis that he was selected to head NASA back in 1971, recognizing that leadership ability, combined with his distinguished career as a scientist. And I think his record at NASA, if you go back and look at that, shows what a remarkable job he did during the very difficult period of time.

As a matter of fact, Senator Ford and I came to this body together and we were assigned to the Space Committee which met in this room, and each of us were junior members of that committee, with each of us sitting at the ends. That was 11 years ago, and we had the opportunity to hear Dr. Fletcher testify many times. We went on tours of NASA's facilities 11 years ago, and I remember we promised him, or the committee did in one of the authorization committee hearings, that we would keep NASA whole for inflation.

We did not keep that promise, not even close to the budgets that we were promising at the time, and so I throw that in and put it in the context that some of the difficulties when we talk about science missions being canceled and why we didn't have a Halley's comet mission and things of that nature, I think I know where the problem lies. It lies back with Congress' unwillingness to look at some of those scientific projects that I personally think should have been funded.

But I give you this background because of the comments that have been made by Senator Riegle and the chairman. It is evident to everybody that there are problems. We need to find solutions. We need to find the cause of the accident and fix it and fly again as fast as we can, because it is not just NASA currently that is at stake; it is the future of our Space Program. It is where we are going to be in the year 2005 and 2010 and the scientific discoveries and the incredible spinoffs that will benefit all of mankind.

That is what is at stake, not just the organization now and the concentration we seem to have on that. As I view this, and the fact that we found ourselves in a situation where there did not happen to be an Administrator because of other difficulties that had nothing to do with NASA, that we needed a strong leader. We not only needed a strong leader who knew the agency, but we needed a leader who the people within NASA had confidence in.

There were other people who were discussed, who certainly had the administrative background. Because of the difficulties—morale and others that were caused for whatever reason within NASA—I felt it was very much like when we had difficulties at EPA a few years ago and the Agency was being torn apart and the administra-

tion made a very wise decision to bring back Bill Ruckelshaus because he could start immediately, with confidence.

That is why I recommended Dr. Fletcher for this position to begin with, as somebody who could come back and hit the ground running and have the confidence, bring back the morale of the agency virtually instantaneously.

I think he has the ability to do that. There is no doubt about his personal integrity. I could have lists a mile long of people that would testify to his personal integrity and his competence and his ability to do this job.

So I certainly endorse his nomination without any equivocation whatsoever, and I look forward to having him back at NASA to start solving these problems, rebuilding the agency, and attaining what this agency can do in space beyond the year 2000 for this entire country.

I thank you very much for the opportunity.

The CHAIRMAN. Senator Glenn.

STATEMENT OF HON. JOHN GLENN, U.S. SENATOR FROM OHIO

Senator GLENN. With the exigencies of time being what they are, we are on another vote, I would ask that my entire statement be put in the record and I will summarize it here in 2 or 3 minutes and then we can go vote.

It is not an exaggeration to say NASA is facing its worst crisis in its 28-year history. A long stream of successes, triumph after triumph after triumph, and then we hit a tragedy. And our judgments were not perfect, and so there has been a significant drop of self-confidence or of confidence of the public and the corporate confidence of NASA itself which is perhaps the a largest threat to the agency of all.

There are a lot of squabbles that have come up. Are we going to continue with the civilian program, military program? What is to be its relationship to other Government agencies? Will it be strictly R&D? Will we have expansion of military activity as part of this program? What are the national security parts of it? What do we do to get a thriving, vibrant, progressive, imaginative Space Program for the future?

In the meantime, we can lose this program by default if we do not get it back on track and soon, and I believe that to be the case. It means a lot more than just pinpointing programs; it means getting new management on board, and new programs, to see that we are headed in the right direction with somebody in charge to ramrod it. And it is that critical.

Now, we have had some reports in the paper today, very disturbing, and I am sure this committee will look into them with regard to Jim Fletcher himself as well as to NASA. And we are not without adequate tools to look into these things here on the Hill, using the General Accounting Office.

I had passed legislation which I proposed back some years ago, giving the General Accounting Office—through the GAO Act of 1980—expanded ability to go in and get information from agencies. So there is no doubt about this committee's ability to do the things that have to be done.

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But it is vitally important—I cannot impress upon the committee too much my feeling that it is vitally important that we get leadership over there. We are approaching 3 months since that accident. At a time when they needed leadership the very most, we held off and held off and held off and agonized over who was going to be the one to head up NASA.

You cannot go along with an agency in limbo as important as this, it just cannot be done, and expect it to recover all on its own, with some sort of ad hoc acting leadership. It just does not work.

I just cannot express myself strongly enough in that particular area, so it is vitally important we get someone there and Jim Fletcher was on my very short list of people that I submitted over there. He had experience there. He had been head of NASA for, I believe, 6 years or 6½ years, something like that, and he has the managerial ability, the technical ability, the personal integrity to put that agency back on course so we can continue to be the world's leader in space, not flubbing around with lack of leadership over there.

I just deplore the fact that we have gone 3 months at a critical time of not being able to pull people together over there, and so I think Jim has all the qualifications that are needed. I am sure you are going to look into all these reports.

I do not know what happened in these reports. I am sure you will look into them. I am sure one of the reports is he made some bad predictions over there. Well, in the R&D program that is not too unusual. I do not know whether the extent of the overrun is his fault or not, and I am sure he wants to address that. Criticism of poor cost projections is certainly justified, but it is not a reason to reject his nomination as I see it.

It has gone too long without leadership over there. So I just hope that the committee can look into these things as expeditiously as possible, spending whatever hours of the day and night you need to get this thing through. We need to get on with the job and I urge an expeditious examination of Jim Fletcher's record, credentials, and I am glad to recommend him to you and I hope that it results in a favorable vote in sending this nomination to the Senate floor.

Thank you very much.

[The statement follows:]

STATEMENT OF HON. JOHN H. GLENN, U.S. SENATOR FROM OHIO

Mr. Chairman, it is not an exaggeration to say that NASA is facing the worst crisis in its 28 year history. The Challenger accident has put our space program back many months at least, eroding our competitive position in space, and there has been a significant drop of corporate self-confidence at NASA which is perhaps the largest threat to the agency of all.

This crisis has revived all the squabbles that have erupted from time-to-time about the direction of the U.S. space program. The goals of the manned space program have been brought into question, and even the program itself has come under attack. There have been questions about the role of NASA—should it stick to strictly being an R&D agency, or is there room for it to be an agency in charge of operations as well?

In the meantime, we can lose the civilian program by default if we don't put the program back on track, and soon. That means a lot more than just pinpointing the problems that caused the Challenger accident and fixing them. It may mean revamping the management structure at NASA so that we put a stop to the waste, fraud, and abuse, as reported in today's New York Times, that were documeted by

NASA's own Inspector-General's office, the Pentagon's Defense Contract Audit Agency, and the General Accounting Office.

It will come as no surprise to anyone that I am one of the biggest supporters of the space program. But I am also a supporter of good government, and the taxpayers receiving a dollar's worth for a dollar spent.

In the New York Times story there is a statement by a GAO official who has audited the space agency for ten years, saying that NASA has been slow to provide material needed for audits and sometimes never provided all the information required by law.

Mr. Chairman, I was the co-author of the General Accounting Act of 1980, which significantly expanded the powers of the Controller General to carry out auditing functions of both government agencies and government contractors. In particular, under the provisions of that Act, the Controller General can take an agency to court in order to force them to produce documents which the Controller General is entitled to have under law. If the GAO is having difficulties in getting NASA to produce documents, I urge the GAO to use the full provisions of the GAO Act of 1980 in order to ensure that proper accounting and proper auditing of the activities at NASA take place.

Now Mr. Chairman, it is vitally important during this period of crisis at NASA, that it be headed by a person who has the managerial ability, technical ability, and personal integrity to put the Agency back on course so we can continue to be the world's leader in space technology and applications. I believe Jim Fletcher has all the qualifications that are needed to do the job. Much was made in the New York Times today about Jim Fletcher's role in making some very bad predictions on the cost of the shuttle. The criticism of those cost-projections is certainly justified, but that alone is not a reason to reject Jim Fletcher's nomination for the post of NASA Administrator today.

In conclusion, Mr. Chairman, I will only say the following: America has received much from the space program, ranging from the saving of lives because of better weather prediction from satellites to the verification of arms control agreements that have made the world a safer place to live. The space program has many other benefits to give to us in the future. We need to get on with the job, so I urge an expeditious examination of Jim Fletcher's record and credentials, and, if the Committee finds everything in order, an expeditious favorable vote to send his nomination to the Senate Floor.

The CHAIRMAN. Senator Glenn, thank you very much. Senator Garn, thank you.

Dr. Fletcher, do you have an opening statement?

Your biographical sketch will be included in the record.

[The biographical sketch follows:]

BIOGRAPHICAL SKETCH OF JAMES CHIPMAN FLETCHER [1]

Address: 7721 Falstaff Road, McLean, VA 22102.
Date of birth: June 5, 1919.
Place of birth: Millburn, NJ.
Marital status: Married.
Full name of spouse: Fay Stanley Lee Fletcher.
Names and ages of children: Virginia Lee Fletcher, 37; Mary Sue MacKenzie, 35; Barbara Jo Rush, 27; and James Stephen Fletcher, 32.
Education: Brigham Young University, 1937-1939; Columbia University, 1939-1940, A.B., June 1940; California Institute of Technology, 1945-1948, Ph.D., June 1948;
Employment record:
9/77 to Present—University of Pittsburgh, Pitts., PA, teaching.
5/77 to Present—James C. Fletcher and Associates, McLean, VA, consulting.
4/71 to 5/77—NASA, Wash., DC, administrator.
7/64 to 4/71—University of Utah, Salt Lake City, UT, president.
6/58 to 7/64—Space General, El Monte, CA, engineering.
3/54 to 6/58—Ramo-Wooldridge Corp., Beach, CA, engineer.
6/48 to 3/54—Hughes Aircraft Co., El Segundo, CA, engineer.
10/45 to 6/48—California Institute of Technology, Pasadena, CA, graduate student.
7/42 to 10/45—Princeton University, Princeton, NJ, research physicist.

[1] The full statement is in the Committee files.

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7/41 to 7/42—Harvard University, Cambridge, MA, special research association.
8/40 to 7/41—Bureau of Ordance, U.S. Navy, Wash., DC, contract employee.
Government experience: See above.

Senator RIEGLE. Mr. Chairman, might I just inquire of you? I think it is very important that everything that Dr. Fletcher says has a chance to be heard, and I know Senator Gorton wants to hear it. This is apparently the last vote of the day, I am informed, and I am wondering if, and I do not want to miss anything that you have to say, either, and I am sure the other members feel likewise, I wonder if, and I am not disputing your call, I am just wondering if we would be better off maybe to just suspend for 5 minutes.

The CHAIRMAN. That is fine with me. Why do we not then recess until quarter to 4. When Senator Gorton comes, maybe you can start slowly, and we will try to get back.

[Recess.]

The CHAIRMAN. Dr. Fletcher, I am sorry for all of the delays. I think that that completes the Senate schedule for today, so that should be the end of the inconvenience. If you have a statement, would you please proceed?

STATEMENT OF DR. JAMES C. FLETCHER

Dr. FLETCHER. I have a very brief statement, Mr. Chairman. I would first like to say to all of you that I am pleased to appear again before you after all of these years. I am also honored to be asked by the President to be nominated for the—I was going to say the next Administrator of NASA, but to come back to NASA again.

During the years that I was Administrator, this committee and myself spent a lot of time addressing some of the challenges that were mentioned earlier, similar challenges, and it is absolutely necessary for the Administrator and this committee to work together to get the job done that you all were indicating earlier. I think as a result of the cooperation and the going back and forth between this committee and NASA.

The results that NASA has accomplished during the 28 years of its existence, I think, have been exemplary, with some exceptions, of course. The challenges it now faces, of course, are quite different. We have to move ahead. And they are probably greater, as Senator Glenn said, than they ever have been in the 28 years of NASA's history. The loss of the *Challenger* has brought us up against some very difficult practical problems. We have got to fix what went wrong, and we have got to assure ourselves that the next flight and all the other flights are safe, or at least as safe as we can possibly make them. We have to return the shuttle to normal operation, but most important or just as important, we have to take care of all of the launch needs of the Nation whose schedules have been disrupted by the accident.

These are not easy or routine tasks, but I am convinced that they can be done. I should add that I agree with Senator Riegle that we do have to take a look at the personnel and make sure that they are up to par, and as dedicated and as motivated as they have been in the past, these are some of the less tangible things that have to be done, and it is not so easy to see how that can be done, and it is going to take some months or years before we can address the

problem of the morale and the seeming loss of confidence of the personnel at NASA.

Obviously, we cannot bring back the lives of those that we lost on January 28, but we can restore the confidence and the purpose and the momentum which I know they would have wanted so the American Space Program can rise to even greater accomplishments. We are on the threshold of what I consider great opportunities. Some of them were mentioned earlier. We are ready to begin building the first U.S. space station, and to begin the permanent manned occupation of space. We are ready to launch the first space telescope, which will allow us to understand the universe as never before. We are ready to send the Galileo mission to Jupiter and to launch Ulysses to explore for the first time the polar regions of the Sun.

We are also on the verge of great strides in space transportation, the national aerospace plane, and the use of space for practical objectives, and many other research and development objectives. The loss of the *Challenger* did not make these opportunities less important or less real. In fact, it made it more important that we pursue with vigor and determination what you all have outlined for us and what we have set out to do.

This is a time for recommitment to the vision of American leadership in space. Mr. Chairman, I would like to work with this committee as nearly as possible to put NASA and the civilian space program back on track, and if you confirm me for this position, there is no question that we can do it. Mankind will explore the universe. We will understand it and we will occupy it. That is as inevitable as the discovery of the New World was 500 years ago. The only question, as Senator Glenn mentioned, is, will America be the leader in this program? With your help, we will.

That concludes my statement, Mr. Chairman.

Senator GORTON [presiding]. Dr. Fletcher, thank you very much. Please accept the apologies of the committee for the stop-and-go nature of this hearing to this point, but those at least have indicated that we can now go through to completion without further interruption.

Senator Riegle in his opening statement mentioned what I suspect was a rather offhand comment on your part shortly after the *Challenger* disaster with respect to the Rogers Commission. I wonder if you would now share with us your view of the quality and thoroughness of the Rogers Commission's investigation to this point and what you see the relationship between NASA and the Commission being between now and the completion of its charter in June.

Dr. FLETCHER. Mr. Chairman, before I answer that question directly, let me say that I have a great deal of respect for all of the members of that Commission, many of whom I know personally. They are outstanding Americans, and I think they are doing an outstanding job, although it is a very difficult one.

Unfortunately, I made a careless remark which was highly publicized, not about the Commission, but about the press and the way they were handling the Commission reports. I would like to apologize publicly for making that remark, and again await the results

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of the Commission, and as you might expect, if I am confirmed, I will try to support the conclusions of that Commission.

Senator GORTON. Dr. Fletcher, do you have any kind of commitments, either expressed in connection with having received this appointment or implied in your own mind with respect to the senior personnel at NASA? Are you free and have you made a determination as to whether or not personnel changes are required in order to restore it to its mission? Are you free to undertake those changes as you see fit?

Dr. FLETCHER. Mr. Chairman, I am reasonably familiar with the civil service system, and I am reasonably sure that we can make the changes that are needed within the constraints of the civil service system. We have done so in the past, and I think we will continue to do so in the future. What changes they must be, of course, remains to be seen. I will have to dig more deeply into the program, just as Senator Riegle suggested, and find the weak spots and make the necessary changes.

Senator GORTON. Many of these senior people at NASA, I take it, were at NASA, and some of them in senior positions when you were last Administrator. Is that not the case?

Dr. FLETCHER. There are many who are still at NASA, Mr. Chairman, that were there when I was there. Most of the people in leadership positions, however, were somewhat junior when I was there, and so I really am not in a position to judge from a distance how they have behaved in the 9 years since I left.

Senator GORTON. But you feel you will be able to judge that performance objectively as you get into this position?

Dr. FLETCHER. Absolutely, Mr. Chairman.

Senator GORTON. This morning, Dr. Fletcher, as you are well aware, the New York Times printed a long review of a number of audits and comments, some from the inspector general of NASA, some from the Comptroller General, some from other agencies, about both the decisionmaking process in NASA and what it termed cost overruns.

While I am sure you have had no more than simply a chance to read that article, I wonder if you can comment both on the article itself and on the underlying criticisms, both expressed and implied, which were contained in some of those audit reports.

Dr. FLETCHER. Well, Mr. Chairman, I have read the article in the New York Times, and needless to say, I was a little bit shocked. I was not sure that he was talking about the same agency that I used to be the Administrator of. It is true that when you find things in the GAO reports and in the inspector general reports that there is something to that, those are not inaccurate statements. I think, however, that a summary of my quick review of it and checking with the inspector general that wrote some of those reports, I am under the impression that NASA is still one of the best managed agencies of the Federal Government, as I think it was when I was Administrator.

Senator GORTON. Does that article in connection with its statement about costs, does it reflect the share or percentage of those costs which were simply a result of inflation as against true cost overruns and misestimates of the nature of the job to be done, and do you have enough familiarity with this perhaps to divide into two

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categories, the portion of increased cost which was simply due to inflation and the portion of increased cost which was due to the fact that the job turned out to be more difficult than NASA may have thought at the beginning?

Dr. FLETCHER. Well, Mr. Chairman, it is hard to make a general statement on all of the allegations made in that article, because each one of them deserves a different set of responses. My impression—of course, I was not there during the whole time referred to by the article. I left in 1977—but I am under the impression that there was a mixture of inflationary costs plus real cost, and it was hard to separate which was which. I will address, though, the problem which I am familiar with or was familiar with at the time that I was at NASA. A lot of the material that was referred to happened long after 1977. When I was at NASA, however, we did do our best to estimate the cost of all R&D programs, and I think we did a reasonably successful job of managing them within the cost, the original R&D cost estimate.

The only exception, I think, to the programs that I know of, at least, was in estimating the number of flights that the space shuttle would fly. We had estimated a much higher number than it now seems to appear. Although nobody really knows the number of flights in the future, we were making the best guess at the time, and we had a lot of help doing that. We may have overestimated the number of flights for the complete five-orbiter fleet which was required at that time.

On the other hand, time will only tell whether we were way under estimating operational cost, but that had a lot to do with the increase in the cost per flight.

Senator GORTON. Could you now outline for me to the best of your ability, and I recognize you will have to do this in general terms, what you see your most urgent task to be as you take over this agency? How will you set your own priorities between what one might call the physical problems of NASA, that is to say, recommending to us priorities, where we ought to be going, and what our goals for the next decade or two decades should be, and internal problems in the agency, morale, to which you have already referred, and the urgency or advisability of a number of some reorganization in the decisionmaking process at the agency.

Dr. FLETCHER. Well, it is hard to say, Mr. Chairman, which has the highest priority. Both of them, both the reorganization of the agency and the strengthening of the procedures, are just as important as the mechanical fixes, and both of them, as I understand it, are already under serious review within NASA. I cannot say which is more important than the other, but we have to get on with the job. We have to get on flying again safely. We cannot—there is no excuse for having another accident, and also, however, taking care of the missions that we have committed ourselves to, particularly the scientific missions, the Defense Department missions, and the commercial missions, all of which we had committed to various agencies to do.

Senator Gorton. And would it be your conclusion that problems of morale and esprit d'corps within the agency will be taken care of in part, at least, by establishing a clear set of guidelines as to when

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you are going to shuttle flights and what specific decisions have to be made in connection with flight safety?

Dr. FLETCHER. Mr. Chairman, I could not have said it any better. Getting flying again on the schedule that we commit ourselves to is critically important to all people in the agency as far as their morale, and not only that, as far as their motivation and dedication. That is part of making NASA work, is motivation and dedication. These are, were, and I think still are, dedicated civil servants, and they can do the job if they are properly motivated.

Senator GORTON. Since January 28, a great deal of 20/20 hindsight has been devoted to a concern that we put too many eggs in one basket by relying almost exclusively on the shuttle to the exclusion of expendable launch vehicles. The last few days, of course, we have seen that ELV's can fail just as orbiters can. Though obviously the cost is great, the cost in lives is totally different. Does your hindsight give you any better view of that subject? What are your present tentative views on whether or not we should have a greater emphasis on ELV's in the future than we seemed to in the last half-dozen years or so?

Dr. FLETCHER. Mr. Chairman, I think it is vitally important that we have a mixed fleet. We need some ELV's and we need another orbiter to replace the *Challenger*. What that exact mix should be is really the question, and for the near future it is quite clear to me in a way that we will be relying primarily on ELV's, and I think it is most unfortunate that the Air Force had the accident last week on the Titan, because that is really going to worsen the backlog of space missions, and so the sooner we can get both of them fixed, the better the Nation will be.

Senator GORTON. Is it your view that the next major American initiative in space should be the space station, and that we should attempt to have initial orbital capabilities with the space station?

Dr. FLETCHER. Mr. Chairman, when you say the next major mission, I think that is a fair description of it, but there are many other missions that are also major. I think it is awfully important, for example, that we get on and fly the space telescope, for example. It is awfully important that we get on and fly what we now call the Galileo mission. It used to be called the JOP mission when I was here before, Jupiter orbiter probe mission.

Those scientific missions are also important, but the next large, major space mission, of course, is the space station.

Senator GORTON. The international partners we have recruited into the space station program are quite emphatic about being equal partners and not simply tag-alongs. How do we balance our national technology transfer interest with that of allies and our own continued leadership in space?

Dr. FLETCHER. Mr. Chairman, that has to be done very carefully, and to be very precise about it, it is difficult from where I sit now, but you can be assured that we will take every precaution not to let technology be transferred unwisely to the Europeans and our other allies, but I am also equally sure that they are not likely to be transferring technology to ourselves. We were able to do this rather successfully on the space shuttle. As you remember, there was European and Canadian participation on that. I think very

little technology was transferred to the Europeans during that period.

Senator GORTON. With the emphasis that we are going to have on the orbiter, on the space station, has NASA continued a proper emphasis on its functions as a research and development agency, or are we focused too much on specific initiatives?

Dr. FLETCHER. Mr. Chairman, it is very difficult to answer that in a specific way. I think NASA's major function is as an R&D agency, and I think most of the missions that we have outlined for ourselves or that have been outlined by you and the President are stongly R&D oriented. In fact, we regard ourselves, I hope correctly, as at the cutting edge of technology, and most of the programs that we are jointly involved in, I believe, are at the cutting edge of technology.

Senator GORTON. Dr. Fletcher, I have many more questions but I have already taken up too much time and I have four colleagues waiting here, so I will now recognize Senator Riegle.

Senator RIEGLE. Thank you, Mr. Chairman. Our ranking member of the full committee is here, and I do not know if Senator Hollings wants to make a comment about Dr. Fletcher.

OPENING STATEMENT BY SENATOR HOLLINGS

Senator HOLLINGS. I will take an opportunity, and I apologize, Doctor, in that we had an amendment on the floor and we have just completed that vote. I have put an opening statement in the record.

I commend your dedication and willingness to come back and serve where you have already served very, very successfully. I think that the single most acute need that we have in our Space Program is credible, confident, reliable, and respected leadership for this particular program.

We might have a heyday as Senators over a financial statement, and I have gone over yours. Necessarily you have a financial statement because you have succeeded. As the ranking member I have reviewed that. The members who are all very willing and able to look it over are invited to do so.

I expect that you would recuse yourself from any kind of conflicts or disallow yourself, or divest I should say, yourself from any kind of ownership where there is a concentrated business goings on between NASA itself and that particular industry. I want to say that in the open here, because I have gone over those things, and I will hold up on my other questions. They do not give me any bother whatsoever.

There was a story or two in the morning news that ordinarily would start a good 2 or 3 month investigation but we have even again more important things when we have a person of known credibility clean as a hound's tooth and dedicated enough to come back and lead this thing so that we can save a lot of time on the one hand and a lot of the talent on the other hand.

So I welcome you to your post, and I appreciate you and the chairman yielding so I could say that.

Dr. FLETCHER. Thank you, Senator.

Senator RIEGLE. Dr. Fletcher, we have discussed some of these matters before in our private conversation, but I want to touch on some of them here.

Is it your sense at this point, and I recognize that you are still not settled in here, but is it your current feeling that it is important that we begin work on a replacement shuttle? Presuming that we do, should we be building one, or do we need more than one if this is going to be the main transportation vehicle out past the turn of the century and maybe as far ahead as 2005, 2010? Does one additional orbiter do the job for us, or should we be thinking about perhaps two? What is your thought on that?

Dr. FLETCHER. Senator Riegle, I think I am on record as having supported five orbiters for some years and was disappointed when it was trimmed down to four. I think, however, at this time with all the deficits that are floating around, it would be unwise of us to request funds for more than a replacement orbiter for the *Challenger* that was lost.

Senator RIEGLE. Assuming we get started, what is your view as to how soon we can have that replacement orbiter ready to fly?

Dr. FLETCHER. I would have to be guided, Senator Riegle, by what the people at NASA have told me. I have not dug into it deeply enough to know any better. They estimate between 3 and 4 years before a new orbiter could be made ready.

Senator RIEGLE. Let me ask you how you feel. You have been away now for 9 years, but you have been very actively involved in space activities in the private sector and interacting with the Government. I think a lot of people are surprised when they learn that the Defense Department now has a space program that is twice as big as the NASA Space Program and is growing.

I am wondering what this means for the future of NASA. I am wondering if we really need to have two entirely separate organizations of this scale and size. Should we be thinking maybe of trying to consolidate this into one operation, perhaps NASA? I am just wondering where we are going here.

It seems to me NASA is becoming a smaller and smaller part of the overall space activity, and at some point it starts to become the tail on the dog rather than the dog, and I just wonder what we should make of that and what your thoughts are on it.

Dr. FLETCHER. Senator Riegle, I think that the fact that the Military Space Program is growing faster than the Civilian Space Program is not a big concern of mine. I do have a concern, however, that the Civilian Space Program which Congress, in its wisdom, created in the form of NASA has been under severe budget constraints not only during the years I was there but since.

If we are going to carry out anything like the program that you would like and that the National Commission on Space apparently would like, although the report has not been released yet, I think we have got to do something over the long term to restore that civilian space budget.

Again, this is a time of severe deficits and so I am not so sure how far we can go this year

Senator RIEGLE. I think that question, though, of whether the defense base program grows at the expense of NASA is now a policy issue that is real, and I think it is going to have to be addressed. I

do not ask you to say more about it today, but you have always been pretty blunt in your comments and I think it is helpful that we try to frame these issues so that we can understand what our choices are.

So I hope if you have more thoughts on that later on down the line, you will share them with us.

Dr. FLETCHER. Senator Riegle, I do want to correct an impression in case I misspoke. I do not think the Military Program should grow at the expense of the Civilian Space Program. If there is any of that going on, I would like to know about it.

Senator RIEGLE. Is it your view that NASA ought to try to maintain a balance in its activities as between military launches that need to go with NASA equipment, the scientific and research activities and the commercial activities as a third part? Is it your general thought that there ought to be a balance between these three?

Some people have said that with the backup now we are not able to fly for a period of time, and with this other explosion last week and so forth putting more pressure on the launch schedule, some people are suggesting that maybe we ought to take the commercial activity off the future shuttle missions and concentrate solely on the other two.

What are your thoughts on that?

Dr. FLETCHER. Senator Riegle, as you know there is an interagency committee that has been set up to address that program or that problem, I should say, and I will have to wait to see what that committee comes up with.

From my point of view, NASA ought to continue with a balanced program. Now having said that, that means that we should launch all three kinds of missions.

On the other hand, it is quite possible that you may want to launch some in different ways than others. For example, it may be, except for the recent Titan accident, that you may want to offload some of the military payloads onto Titans. Maybe that is not going to be so easy after all, and the same could be said of commercial payloads.

In the near future it is pretty clear that there is not going to be very much of anything in the next 2 or 3 years except expendibles and whatever limited capacity in the shuttle that we have, and to balance all of those carefully in terms of priorities is not going to be an easy job.

Senator RIEGLE. From your vantage point out in the private sector for the past 9 years, what is your sense for the pressure that we are getting from foreign competition, both the Europeans and the Russians, of course, with the space lab that they have going?

How intense is this international competition, and how is it affected by the fact that we are now shut down for a period of time and we are going to have a lot of catchup to do? Can you give us a sense for the international competitive situation?

Dr. FLETCHER. Senator Riegle, there are two aspects of the international competition. One has to do with what I will call technological lead for want of a better expression which is exhibited by the space station and by the space shuttle and so forth.

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The other is in terms of scientific achievements. There is a third, and that has to do with launch vehicles. I believe that is what you are referring to. I think there is a competition between ourselves and the Europeans in terms of launch vehicles and the fact that there is an Ariane launch system. The French are eager to accommodate as many payloads as they can, and this tends to create an overcapacity in terms of launch capability not in the immediate future but in the distant future. In the immediate future I guess we will use all the Arianes we can, so in that sense there is probably intense competition between ourselves and the Europeans.

In terms of the technological lead I think the main concern is the Soviet Union, and I think we cannot afford to fall behind the Soviet Union in any major aspect of technology, particularly civilian space technology.

There it might appear that in some respects the Russians are ahead because they have a modest space station. I think by the time the early 1990's come along, we will have caught up with and passed them in that regard, and in many other areas I think we are ahead of the Soviet Union.

So it is kind of a broad question, and I do not know which aspect of it you wanted me to pursue.

Senator RIEGLE. Those were helpful answers. I was concerned today, though, when we were talking about the space station. If everything goes right, we are talking about having the space station up there in 1994, and that is essentially 8 years from now. The Russians are not going to stand still in the meantime, particularly in an area where they have tended to concentrate their efforts.

So they are up there with their efforts, modest though they may be. I am concerned about that. It seems to me that we have got a real gap here that has been accentuated because we are in a shutdown circumstance.

I just want to ask you one other thing, not preventing my colleagues from also having a chance to ask their questions now, and that is we have had several meetings on this space plane. When the space plane technology and working model and eventually moving to that technology if it comes along properly, in your own mind, in your professional judgment, what is the time window in which if things go right you see the space plane coming on as a successor to the shuttle system?

Dr. FLETCHER. Senator Riegle, there are two aspects of that question. One is when will we have an experimental space plane? I am somewhat familiar with that because NASA is the major participant in that activity or will be. I would expect that we would have a test vehicle flying sometime in the early 1990's, although that is under review as you know.

When we will have an operational space plane during real missions, carrying payloads back and forth to space or transporting people from one part of the Earth to another is hard for me to judge. Just from what little I know it sounds to me like that is beyond the turn of the century and therefore may or may not be a follow-on to the shuttle. There may have to be a gap filler in between.

I think you can only make that decision at the time the first experimental plane flies.

Senator RIEGLE. Would I not conclude from that, then, that the shuttle is going to have to be the work horse for at least the next 15 years in all likelihood, even with an ELV fleet perhaps under the side?

In terms of man missions then, I guess is that not another way of saying that the shuttle is going to have to be the workhorse?

Dr. FLETCHER. For the next 15 years, Senator Riegle, you are absolutely right.

Senator RIEGLE. It seems to me that that also means that if we build a replacement shuttle and with a backup to four, we are still below the five that you and some others thought were originally needed. It seems to me that leaves us in a highly vulnerable position. It leaves us in the position we were in prior to this last accident, and God forbid if anything should happen. It always can. There can be something that is beyond anybody's control that can intervene, and let us hope it does not happen.

It sounds to me as if we are going to run that kind of very narrow sort of limited risk that tightening down all the procedures in every respect—the mechanical problems that need to be fixed, the procedural issues, the personnel lineup and anything else that falls into other categories—it seems to me that tightening the system down becomes really the key to whether or not we are going to be able to get through the next 15-year period where we are running with a very narrow base of equipment and with none to spare so to speak.

So it seems to me that feedback into a requirement that we really scrub things down very, very hard here to be sure that any avoidable problems are found and fixed.

Am I right in seeing it in those terms?

Dr. FLETCHER. Senator Riegle, if I interpret you right, what you are saying that we had better not have another accident for the next 15 years.

Senator RIEGLE. Certainly not one that takes an entire shuttle with it, or else it seems to me we ought to be building more than one now if we think there is any appreciable risk. We will be putting ourselves right back in this hole again.

Dr. FLETCHER. My feeling is we should not have another accident in the next 15 years, and we will do our best not to do that.

On the other hand, some years from now I may come around and request money for another orbiter, but not this year.

Senator RIEGLE. Thank you.

Senator GORTON. Senator Gore.

Senator GORE. I would like to direct a few questions to you, Dr. Fletcher, and thank you for coming. I want to ask some questions about the report that was referred to earlier, but before that I want to ask your opinion about restructuring the agency, reorganizing the agency and reasserting the ability of the administrator to oversee not only headquarters but the centers as well.

Do you agree that all those things should be done?

Dr. FLETCHER. Senator Gore, it is difficult to really make predictions about what has to be done to tighten up the NASA team. Certainly there has been some looseness, apparent looseness, from what I read anyway, between headquarters personnel and the centers.

That relationship has to be a close one; otherwise, we cannot make the program go. So whatever has to be done will be done, but I cannot predict in specific details how that will work out. Certainly that has to be fixed.

Senator GORE. Do you anticipate that your remedy would include restructuring the agency?

Dr. FLETCHER. Senator Gore, when you say restructuring I am not sure what you mean. Certainly putting the appropriate people in the right places and putting the appropriate procedures in the right places and writing what we call level I, level II, level III specifications all has to be reexamined closely and tightened up.

Just what that involves in the way of restructuring the organization I think has to remain until after I have had a chance to study it more.

Senator GORE. Now let me turn to some specific questions about the allegations that were included in the New York Times article this morning.

You responded in general terms to the thrust of the article but you are appointed to take over this agency at a very critical time, when public confidence has been shaken and when you were viewed as the best person to reestablish that confidence.

It seems to me that that was based in part upon a general perception that during your prior tenure at NASA things were great. The public attitude toward NASA was certainly great, and it was seen to be a great success.

When you look at the cumulative total of these GAO reports and inspector general audits, they challenge that perception. The Times, in bringing them together, has done precisely that.

Just to begin with, there seems to be a charge of a cumulative amount of waste of on the order of $3.5 billion. Do you challenge that?

Dr. FLETCHER. Senator Gore, I have not had a chance to either look at the details of the allegations or to check and see whether any of those numbers are in the right ball park. I can only comment generally, particularly on those things that happened after I left the agency in 1977.

All I can say is that in talking with the inspector general that made those studies, she indicated that from her perception NASA was perhaps the best run agency in the Federal Government, and that is about all I can say because that is all I had time to check between this morning's paper and now.

Senator GORE. Were you familiar with any of the cases cited? Some of these sound like defense contracting problems, you know with the hammer and all of that stuff. You have examples of a building sold for a small amount of money, $360,000, and then NASA turns right around and rents the same building for $3.5 million.

Are you familiar with that episode?

Dr. FLETCHER. Senator Gore, I am not familiar with that. May I make a suggestion? If you request us, we would be glad, if I am confirmed or before, to respond to all of those allegations. Between this morning and now, however, there really was not time even for NASA to respond.

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Senator GORE. Let me ask some specific questions about things in this analysis that took place while you were Administrator, and they have to do with the projections of costs and so forth.

One of them, just to take one example, was that you testified before the Congress that the cost of each shuttle launch would likely be $10.45 million. The cost instead is now $279 million per launching.

At the time you made that prediction for the Congress, the General Accounting Office said to the Congress that your figure was "misleading." It cited costs that were not reflected in the prediction. I accept the fact that the Congress participated in all of these projections and decisions, and certainly there is enough blame to go around to the extent these projections were way off.

However, the Congress does have to rely on the Administrator to a great extent, just as the whole country will have to rely on the Administrator during this upcoming period to reestablish the agency's sense of purpose and so forth.

How could you have been so far off from $10 million to $279 million per launch?

Dr. FLETCHER. Senator Gore, I do not recognize the second figure at all.

Senator GORE. That is the actual cost per shuttle launch now.

Dr. FLETCHER. One of the first questions I asked when I found that I was going to be nominated to come back to NASA was just that question, and we never stated the cost of $10.45 million per launch as an absolute figure. This was an estimate, and it was estimated in 1971 dollars. I do remember that much about the early estimate.

From what I gather in talking to NASA personnel now, that cost on the same basis, if you count the same things that we counted, then would be more like $40 million in 1971 dollars. Now you have to inflate that according to today's dollars. That is still a large factor, a factor of four, but my only answer to that is that something happened on the way to the bank, so to speak. When I left the agency the estimate was, instead of $10.45 million, something like $12 million per flight in 1971 dollars. I think what probably happened was that—and again these were only estimates and this is an R&D program—the number of launches anticipated were less, and therefore the fixed cost would increase the cost per flight.

The other thing that happened is that we were still on the learning curve until the accident. So as time goes on the cost should come down.

Then I want to quickly add that all the time we were talking with this committee some of you may remember that we kept reiterating that the primary purpose of the shuttle was not to be a cost effective way to gain access to space but to pursue the technology required for routine access to and from space. I think NASA has achieved that goal, and that was always the primary goal of the shuttle program.

Senator GORE. Another question along the same lines. You predicted for the Congress that the cost of lifting shuttle cargo would be $100 per pound. The cost now is $5,264 per pound. Adjusting for inflation, taking into account the reduced number of shuttle launches, still that seems like it is, is wildly off, doesn't it?

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Dr. FLETCHER. I do not remember the number $100 per pound. That is another one that I will have to check into. I remember a much larger number.

So again, Senator, I will have to ask that we respond after having dug into it some more.

Senator GORE. Well, rather than citing a long list of other examples and there are too many of them, let me turn now to the question of attitude toward the allegations, attitude—your attitude and the agency's attitude during your tenure toward the persistent criticisms by GAO, the inspector general, et cetera.

They say that NASA has been the most diffcult agency to work with of all in terms of obtaining information and getting cooperation. They say that in letters to GAO, you and your deputies consistently refused to correct many of the problems cited by the inspectors and the auditors, including management errors, spending abuses, delays in hardware testing, lax monitoring of contractors, and optimistic estimates of cost and technical problems.

In talking to some of these people, they describe what they view as an attitude of don't bother us; leave us alone; we're above criticism; you've got to be way off base; we don't have to respond to these kinds of criticisms.

Are they being unfair in their characterization? And I assume you think they were, but could you respond to this?

Dr. FLETCHER. Senator Gore, I don't remember reading, except in the paper, of those allegations. But I think that when I was there, and I think since, we have tried to be as responsive as we possibly could to legitimate criticism by or suggestions by the GAO or by the inspector general, either one.

It is my impression that that has been done since I left as well.

Senator GORE. Well, the cumulative record—and I will close with this, Mr. Chairman, because I know that time is limited and other members of the subcommittee are waiting—but the cumulative impression is not a good one, and I am quite concerned about it.

I do not know what to do about it, because obviously we are on a fast track and the general perception is that you are the person for the job, but I would certainly like to get some more detailed responses from you about how this situation developed, and a lot of it occurred apparently during your prior tenure.

The estimates are on orbiter cost, external tank cost, orbiter payload, turnaround time, number of flights, and the other estimates, the cost per launching and cost per payload pound; some of those mistakes resulted in systematic pressure to get more flights off the ground because more flights off the ground is the way that you reduce that cost per launch and cost per payload.

This pressure has also been a problem. But I look forward to pursuing it with you and your responses to written questions and whatever answers you wish to provide to supplement the record here.

Dr. FLETCHER. Senator, I would be glad to supply that when I am confirmed, but I would like——

Senator GORE. Well, I would like to get it before you are confirmed if that is possible.

Dr. FLETCHER. I wish I could commit to that, but the NASA Acting Administrator will have to do that.

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Senator GORE. No; I would like to get your responses to the allegations about what happened during your tenure.

Dr. FLETCHER. It is a little difficult for me because I am not at NASA yet and I do not have access to the information.

Senator GORE. Well, if you cannot, if it is difficult for you to respond to questions about what you did while you were head of NASA, then it may be very difficult for us to assess or for me to assess your qualifications.

Dr. FLETCHER. I will do my best to respond, Senator Riegle, but let me add quickly—excuse me, Senator Gore—I will do my best to not only respond but to fix any other problems that may be apparent at NASA.

There is always room for improvement and I suspect there is a lot of it at NASA, just as there is any other Government agency. But to answer your question, I will do my best, but I do not have all the facts in front of me.

Senator GORE. Thank you, Mr. Chairman.

Senator GORTON. Senator Rockefeller.

Senator ROCKEFELLER. Thank you, Mr. Chairman,

Dr. Fletcher, I for one am delighted to see you here. I think one of the problems we have in this country is getting very good people not only to come into Government, but having tasted it, to come back into it. Whether that is an act of courage or an act of patriotism, I suspect it is both in your case.

But I am really glad you are going to do it. I look forward to voting for you, and I have known you for a number of years and am proud that you are going to lead this agency.

Senator Riegle raised a question which does bother me. We had the Secretary of the Air Force here a couple of weeks ago, who was talking about the need for more military use of the shuttle in years ahead, and there is no question that if you look at the DOD, the Department of Defense budget, $14 billion for space, and then you look at the NASA one which is really half that, a little over half that, that is competition.

This is the Gramm-Rudman era. There is scarcity. And if one were a betting person, it probably would be better to bet on the Department of Defense in terms of their space success because they tend to be less likely to come under the kind of scrutiny which NASA clearly now has come under.

And so I think this should be of concern to you. You expressed in general terms that in making space policy, there is competition for dollars and, that there is a relationship in space policy, space budget, between the Department of Defense and NASA. When people think of NASA, the people are thinking of civilian programs, most people not really knowing that it carries military payloads into space. This is of concern to me. For some time I have been worried that even before the shuttle accident, that eventually the Department of Defense might just eat up NASA. Simply, DOD would take all of the nonmanned and manned stuff, the cancer research, the medical research, it would go up in NASA for a few more years and then it would fade away.

That is not what you came back to Washington to preside over. Can you reflect just a bit more philosophically on the tension be-

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tween the two agencies or a potential for tension in terms of policy and budget?

Dr. FLETCHER. Well, Senator Rockefeller, I appreciate the kind remarks you said about our long association. With regard to the Military Space Program, they do come together in the space shuttle in a sense, because the space shuttle was designed as a transportation system for the whole Nation; in fact, even for foreign governments because they participated in the development of it.

There is no way that the Defense Department will take over the management of the shuttle or portions of the shuttle during my tenure because it is vitally important that the Civilian Space Program remain intact. And so the main place of overlap will be in the carrying of payloads, and their priorities have to be established and all of the customers have to be taken care of, including the Defense Department.

Senator ROCKEFELLER. Dr. Fletcher, in terms of nonmilitary research, scientific research, Senator Heflin who is here today at the Commerce Committee hearing—at his University of Alabama, there is very interesting work going on in cancer research.

Looking at that kind of thing, basic nonmilitary research, medical, or otherwise, what are some of the things that you look forward to seeing happening in the nonmilitary area?

Dr. FLETCHER. Well, we have to distinguish between the near term and the long term, Senator Rockefeller. In the near term, there are a number of very important scientific missions that have to be dealt with, and I mentioned some of them earlier.

Certainly the space telescope is one that is of crucial importance to the development of astronomy and astrophysics. The Jupiter probe which we call Galileo has to be dealt with. The solar polar mission as we call it, or the Ulysses, all has to be taken care of very early on in the early phases of the Shuttle Program as it gets back on track.

At the same time, though, we have a number of life science experiments, space processing experiments, things having to do with separation of biological materials and so forth. They have to be fitted in somehow to the Shuttle Program once it gets going again.

All of those are what Senator Riegle was calling a balanced program. And I think that that is part of the job of the Administrator is to ensure that we maintain a balanced program.

Senator ROCKEFELLER. Dr. Fletcher, before the shuttle accident, NASA was scheduling 15 flights. They had been looking to move that up to 24 in 1989. In 1981 I think they had a couple flights; one more the next year; one more the year after that; and people have speculated that is a lot of pressure.

There is competition from the Europeans. There is competition, perhaps reliability, in terms of payload performance with potential commercial users. That is pressure. And there has been a lot of talk about that kind of economic pressure on the Space Program.

NASA is talking about, once we get going again, about scheduling nine missions in the first year for the remaining three orbiters. I do not know how it is you reflect on this in terms of your leadership, should you be confirmed, as I am sure you will, for this position—how do you strike the proper balance between pushing forward enough to deal with the realism of competition from overseas

and to deal with the need to be satisfying and attractive to commercial investors, both potential and actual, and yet not getting ahead of the technology to do what it is that you have to do properly and safely?

I think as an Administrator, that would be one of the toughest things that any Administrator would have to do, to find that balance and keep the pressure away, and yet keep the pressure toward safe forward movement.

Dr. FLETCHER. Senator Rockefeller, that certainly is a tough assignment, but it goes right back to the issue of safety and reliability. I do not think we want to fly this mission until we are sure that it is safe and reliable and if we have to slow down the flight rate we will.

On the other hand, I think it is possible if we can get back the dedication and motivation that we have had in the past, to fly a reasonable number of flights per year. Now, I do not know what that number is right now, but you can be assured that we are not going to fly them unless they are reliable and safe.

Senator ROCKEFELLER. I understand your answer. Do you have any reaction to the nine that NASA is now talking about?

Dr. FLETCHER. I do not have a negative reaction, Senator Rockefeller. I do feel that I need to get back and examine all of these things carefully. Nine does seem like a rather substantial number. If you are talking about the first year of operation. I think the first year is going to have to be done very carefully, but nine does not seem unreasonable downstream a ways, or even a higher number.

But again, I think I really need to take a closer look at all of that.

Senator ROCKEFELLER. A final question, Mr. Chairman.

You chaired a panel, Dr. Fletcher, for the President on SDI 2 years ago in which you had a fast track research program for SDI. And your view was at that time that there should be a development decision, moving out of research into development, the decision about that by the early 1990's.

Do you still hold to that view? An early 1990's decision for development, either for or against?

Dr. FLETCHER. Senator Rockefeller, I do not remember the expression in our report, "early 1990's." I think we said sometime during the 1990's. That is my recollection.

I hear the statement often quoted early 1990's, but with the pressures, budgetary pressures and so forth that have been carried on with the SDI Program, that may be a little optimistic. I think General Abrahamson, who is the program manager, should address that, rather than myself.

I think it is only a technology program, Senator Rockefeller, and it is kind of hard to estimate when you can make decisions based upon a technology program. I think mid-1990's is a safe statement, but again it depends upon the budget and so forth as to whether that can be actually done.

Senator ROCKEFELLER. The reason I asked that is because clearly SDI, whatever is going to happen to it, is going to be in clear public competition for budget dollars, as the NASA programs will. You would prefer to have five orbiters; you are going to settle for four for this year.

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You indicated you might be coming back to us for an additional one later. And let's say that one more orbiter now would be $2½ to $3 billion and maybe more, which is about what the President got for research on the SDI Program. So at some point, as each of them grow, if indeed they do, that is a lot of competition.

So that the balance as between SDI and NASA is not currently an issue, but it could become one if both are aggressive, if SDI goes into the development phase, wouldn't you think?

Dr. FLETCHER. Senator Rockefeller, that is a long way in the future. In other words, I think all we said in our study in 1983 was that a decision to go ahead and deploy the SDI might be made in the 1990's. To deploy it is going to take a lot longer than that.

So I think it is going to be the turn of the century before you see the kind of competition that you are referring to. Now, there is going to be competition across the board in all of the Government spending, between NASA and the rest of Government. That, of course, is what NASA is facing and I guess the rest of Government is also.

That is why I would not wish to go on record as asking for more than four orbiters at this point.

Senator ROCKEFELLER. I understand.

Thank you, Mr. Chairman.

Senator GORTON. Senator Hollings.

Senator HOLLINGS. Thank you, Mr. Chairman.

Dr. FLETCHER, with respect to the New York Times article and, my distinguished colleague from Tennessee, I would hate to see a news article on my attitude 9 years ago. I do not know what it was.

I do look at the record and I most respectfully would add—having worked with you as an advisory member on the Office of Technology Assessment Board where I have been a member, plus all of the other eminent positions that you have had on the National Academy of Engineering, and the Werner von Braun Institute Foundation, I could list them here for the record—that irrespective of that particular finding of the GAO report that would indicate some arrogance or disregard, that the contrary has been true from my experience with you.

I think rather than worrying about an attitude at the moment, because the record is overwhelmingly in your favor on that particular point, there has been some waste, fraud, and abuse, and I would ask the New York Times to catch up with the Miami Herald which over 6 weeks ago went in depth into certain NASA contracts' cost overruns excessive billings et cetera. But you should be, as the Senator from Tennessee put you on notice with respect to the GAO report, I would similarly try to put you on notice to the waste fraud, and abuse articles brought up by the Miami Herald which does concern us all on this committee.

Bringing us to the real point of communications, we have thought that NASA has worked extremely well, a tremendously successful program, and therefore we never heard in this committee of an O-ring problem. But the people at NASA did and the various offices did, and they even were so concerned about it last November, they were attending automotive engineering seminars here in Washington, DC, to see whether the automotive engineers may have had some ideas about it.

But these are the type of problems we should be really looking at and be aware of. The headline of the Miami Herald story I referenced says "NASA Is Wasting Millions Various Audits Reveal."

I wish you would look at this article when you take over NASA, because as a committee we will be going into that phase of the contracting and whether or not there is any waste down there that we ought to be getting on top of.

And so point one I would like to make is, please communicate with us on the committee. I liked the statement necessarily that no launches will occur unless it is reliable, unless it is safe. And do not come later and say we cut the budget and that is why it was unsafe. But if you are not able to launch and perform the program due to budget constraints, at least clear the record and this Senator's conscience by coming up here and telling us, because we feel generally we have been not restrictive with the NASA budget.

We feel like we have been rather liberal with it, and proud of it, and ready to go along and work on it. So please communicate with us and look at the GAO report that Senator Gore points out and look at the Miami Herald series of articles that are more to the point right now. And otherwise answer that same question that you were asked back in 1971, which in part I think you did with Senator Riegle. For example, we need to know where do we stand with the Soviets right now.

As an outsider, you are not responsible. You do not have to praise it or criticize it one way or the other. And the tendency would be to minimize its accomplishments so that your record would then look even greater an accomplishment.

Where do you think we really stand with the Soviets? Not is a question I am asked that constantly and I would like your opinion.

Dr. FLETCHER. Well, Senator Hollings, that is a broad question. It is different in different areas. Obviously, they have a space station which is in operation, and in that sense we are behind, but their space station is an enlargement, as I understand it, of the old *Salyut* spacecraft which was similar to our Skylab that you may remember that we launched.

On the other hand, they do have a space station and it is a permanent presence in space and we do not. So we are in that sense behind.

In other areas, however, we probably are ahead in terms of the planetary missions, certainly. We have moved out into the outer planets, which they have not. And not to minimize, but we have, after all, landed on the Moon with six teams of astronauts and brought them back safely, which the Russians have yet to do. And so it depends upon which area. But in the space—permanent presence in space, you are absolutely right; at the moment they are ahead of us.

Senator HOLLINGS. Comparatively, with respect to hours in space and expenditure, how do the two programs compare, the Soviet and the United States?

Dr. FLETCHER. Senator Hollings, I wish I could give you a precise answer to that, but let me tell you part of the difficulty. I would be glad to respond if I am confirmed, but let me give you an impression in advance. It is very hard in the Soviet Union to separate the Civilian Space Program from the Military Space Program.

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Senator HOLLINGS. It is very hard in this country, too.

Dr. FLETCHER. It is easier here, and so it is difficult to say how much of what they are doing in space, for example the space station, is civilian and how much of it is military. In this country, if it were military, you would hear about it very quickly.

Senator HOLLINGS. Thank you, Mr. Chairman. I do have some other questions, but I want to yield to my other colleagues.

Senator GORTON. Senator Exon.

Senator EXON. Mr. Chairman, thank you very much. Dr. Fletcher, welcome to you, and I enthusiastically endorse you and am delighted that the President has made your selection. You come back in at a time when the Space Program obviously needs some direction. I would simply say that I suspect that there are going to be some tradeoffs between our very important "scientific" and "civilian" use of the space technology and program, but with the difficulties, unfortunately, that we are having in the military now with the loss of the Titan booster the other day, you know, some things are going to have to give. I am delighted that you are there, because I think you will provide the proper balance that I think this committee is asking for.

I had a very fine discussion with you recently about this. I said to you then about everything that I wanted to say. I will just make mention of one of the things we talked about there that I think should be laid out on the record, and that is that if there is any criticism I would have of the Space Program even before the most unfortunate accident, was that I hope too much money will not be spent on "public relations." I think you have done an excellent public relations job. I do not know whether too much money has been spent on it or not. I do not know, Senator Hollings, whether the Miami Herald story has anything to say about that. But it certainly is a very popular program with Americans, and I do not believe we need to make it any more popular than it already is.

I would think that with restraints of payloads that we are going to have for both high priority civilian and military needs, that civilians might not necessarily have to go into space in the immediate term ahead. I think that is good public relations. I am not sure it is good planning. But I simply say that I have confidence in you. I think the committee does, and I think that confidence is well founded, indeed, and we wish you the best.

There is just one question that I have. With the launch difficulties that we have obviously experienced recently, are you envisioning that we are going to have to go back to square one, so to speak, on the launch vehicle, or from your knowledge now, which is vast, do you think that we can make significant timely changes in the engineering approach to our lifters and get back on track? And how quickly do you think we can get back on track, measured in the term of months and years?

Dr. FLETCHER. Senator Exon, your comment really, I think, included both the Defense Department launches and NASA launches. I have been in this launch business since about—gee, I hate to think how long, 1954, I guess, and part of the problem is technical and part of it is—I think I used the words "dedication and motivation" of people. People have to believe in what they are doing or they are going to make mistakes, and in the case of NASA I think

we have to convince people at NASA, reconvince them that what they are doing is of very strategic national importance, and therefore they are participating in a national asset, if you like, and when they believe that, they have to recognize that they have responsibility for protecting that national asset, and once that message is clear to the people at NASA, I am sure that we can get back on track. The mechanical fixes also have to be made, but I think we have already, made progress as I understand it, in fixing not only the thing that may have caused the accident but other things that we saw might have been wrong.

In the case of the Air Force, of course, I am not involved in that program, but my guess is that the same principles apply there. They are going to have to go back and regroup just the same as NASA and fix whatever went wrong with the two Titan failures, and my guess is, they will do so.

Senator EXON. Well, measured in months or years, without trying to put you on the spot, what would be your best guestimate at the present time as to realistically how quickly we might get back to a launch schedule, and maybe a scaled-down one, but with some sustained launch schedule? I mean, are we talking about 6 months or 6 years or a year and a half?

Dr. FLETCHER. Senator Exon, I can only give NASA's answer. I would guess that Dick Truly's answer is the best one, and that it is probably going to take at least a year, and it may take a little longer, but I have not had a chance to review the data that he has reviewed, but I have a lot of respect for Admiral Truly, and I would be confident that his answer is correct.

Senator EXON. Dr. Fletcher, thank you very much.

Thank you, Mr. Chairman.

Senator GORTON. We are delighted to have our former distinguished member, Senator Heflin, with us, and we would be happy to hear whatever statement or questions he has.

Senator HEFLIN. Well, Mr. Chairman, I appreciate your allowing me to be here this morning. I was very much interested in the space station. I think I was the first Senator to call for the construction of the space station, and have been vitally interested in it, and of course vitally interested in NASA and its ongoing work. I think that Dr. Fletcher has had an outstanding record and a record to be proud of, and probably really the greatest productive years of NASA were during your administration, and I hope that as you go forward, that that will be true again.

There of course have arisen some things, and I imagine that questions have already been answered, and I do not want to duplicate it, but I assume that whatever problems that could arise, that could cause potential conflicts of interest, that you will take all necessary steps to avoid it, and will do whatever is necessary relative to those measures.

Dr. FLETCHER. I will do so, Senator Heflin. It is good to talk to you.

Senator HEFLIN The New York Times article, of course, raises a lot of questions, and I have seen it just for the first time this morning and have not, other than just hurriedly reading it, gone into it, but from a point of public relations that Senator Exon mentioned, I

think it would be wise to try to answer these matters and to clear up the air on it.

I do not know whether it has been brought out, but one of the first things that struck me relative to you was that as I recall the Office of Inspector General was not created and was not in existence during your term of office. It was several years later before the inspector general's office was created.

Dr. FLETCHER. That is correct, Senator Heflin.

Senator HEFLIN. Well, I hope that as we go along, these matters can be clarified, and I am fearful that NASA right now is in a stage with all its problems that sometimes everybody wants to jump on it, and everybody wants to create problems, and they go to those matters. If each of us had an inspector general as to the interstaff memorandums backward and forward, I am sure they could find a lot of things that were faulty, but we are certainly interested in seeing that the cost is kept to the lowest possible efficient level, and that any abuses and any things of this sort are eliminated, and I am sure that this will be your goal, and we are delighted to see you.

Senator GORTON. I understand that Senator Gore had a statement.

Senator GORE. Just briefly, Mr. Chairman, I wanted to say that unlike Senator Hollings and some of my other colleagues, I have not had a chance to work with you personally. Their experiences in working with you will, of course, be very persuasive with me, and I think generally the reason why your nomination was greated with such warm applause when it was announced was the fact that those with whom you had worked earlier almost uniformly have a very high view of your capabilities in your prior performance. But let me reiterate that as someone who has not had a chance to work with you, I cannot help but be troubled by the very critical review of the period during which you had tenure at NASA.

I am perfectly prepared to believe that a review of events many years ago can inadvertently become skewed. I am prepared to believe that facts can be wrong, that they can be assembled in a way that gives an impression that departs from what the accurate impression should be, but I need your responses to these matters, and I think that the public would like to have a response as well, because there is beginning to be an impression that really because of the Nation's great pride in NASA, it was looked at a little differently than a lot of other agencies, and maybe we need to look at it a lot more carefully.

Now, let me just close with one specific example that I would like to get your response to. And that is a report again from the same compilation of things that at the end of your tenure in 1977, the General Accounting Office took a look at the cost overruns, and found that the accounting controls, the management and accounting controls on projects were such that it was impossible to distinguish between cost overruns that resulted from inflation or cost overruns from cost overruns that resulted from technical problems or simple overcharging.

Now, I do not, if you want to respond now, that would be fine. If you want to refresh your memory and look at the record, that would be fine, too, but those and other problems that are included

in this critical review and others that—I have not seen the Miami Herald pieces yet, but I just think that we need to get some responses to these questions before we vote on your confirmation.

Dr. FLETCHER. Senator Gore, I am just as alarmed by the New York Times article as the rest of you, because some of it referred to my tour of duty, and so I am naturally concerned, and whatever can be responded to quickly, I will do so. I think, however, it does take a longer term look. We have go to into a lot of the details that were suggested in that article that also ought to be done, and if I am confirmed, I will do that whether it is asked for or not, because naturally one is concerned over an article such as that or any other article. I have not read the Miami Herald allegations, but certainly those have to be addressed, too.

Senator GORE. Thank you, Mr. Chairman.

Senator GORTON. Senator Hollings.

Senator HOLLINGS. Well, Mr. Chairman, I wanted to include the Miami Herald articles in the record. The date that I have for the moment is March 16, 1986 just a month ago. And then I would ask consent respectfully, Mr. Chairman, that the cover letter from NASA, John E. O'Brien, general counsel, dated April the 21, to David Martin, the director of the Office of Government Ethics, that cover letter, along with a letter from Dr. Fletcher dated April the 17, 1986, to Mr. O'Brien, the general counsel, as to the disposition of holdings, be included in the record.

Senator GORTON. Without objection.

Senator Riegle.

Senator RIEGLE. Mr. Chairman, you have not had a turn for a while.

Senator GORTON. Well, you go ahead.

Senator RIEGLE. I appreciate the frankness of your answers today, and particularly your good natured adjustment to the goings and comings of the votes and so forth earlier on in the afternoon. I have one area that I want to get into that is a little sensitive, and I have saved it until the end, because I do not want to treat it in a sensationalized manner, but I do want to discuss it with you and put it on the record.

We have held off getting into any elaborate assessment of the *Challenger* accident until the Commission has finished its work. I do not propose to get into it here now in any particular degree, but I must say in terms of NASA's responses as to some of the issues after the fact as I have followed very closely the work of the Rogers Commission and attended the public hearings and listened with great care to the questions and the answers and so forth, there was one occasion particularly when I was really troubled by what I was hearing, and this was in terms of reconstructing what happened the night before the shuttle launch, when there was obviously this very fierce disagreement about whether the conditions were safe enough for the launch, centering directly on the O-ring problem, and where the Thiokol engineers, as you know, were very concerned that the temperatures were just too low, and that it was a very risky situation, and in fact recommended against launch, and there ensued that long episode that evening, and it ended up with a decision to launch, and the consequences that we are all familiar with.

As I listen carefully to the Huntsville people come in and answer questions of the Commission, I must say I was very troubled about what I heard, and found it unconvincing, and I think it is clear to say, and I cannot speak and would not imply that I would even want to try to speak for the Commission, but in terms of what they themselves said that day, and not just one, but several members, I think they were really taken aback because the thrust of the responses was more or less along the lines that everything we did was fine, and if we had to do it over, we would do it all the same way. It had the ring for me, and I want to sort of step back out of the details of it, but it had the ring to me of what I hear bureaucracies of all different shapes and sorts say when problems happen, and that is, it is not my fault, or it is nobody's fault, or what happens is that you sort of get a stone wall where nobody is responsible for anything, and in a sense these things are unavoidable.

And I have come to the judgment, as I follow this very closely, and I think the Commission has come to the judgment that this particular accident in all likelihood was avoidable in light of much of what was known ahead of time, and whether or not you agree with that judgment at this particular time, there certainly has been a lot of concern expressed about the procedures that led to the decision to go ahead in the face of the weather conditions and the low temperatures and so forth. I guess the thing that I am concerned about is that that kind of institutional reflex of coming back when problems happened and saying it is not my fault, and the next guy says, it is not my fault, and you finish, and it is nobody's fault.

And yet things have gone wrong, and they have gone wrong to a very substantial degree, and seven lives are lost, and all the equipment, and the program shutdown, and so forth and so on, and I would hope that having been out of the agency for 9 years and coming back into it, that in an evenhanded and fair way, and you strike me as being that kind of a person, that we sort of penetrate that kind of thinking to the extent that it exists, and that is not to say that any particular person is responsible for any particular thing, but I think we need to know precisely what happened and who did what and why, and that we do not just paper over everything and sort of say, well, you know, let us look ahead, let us not look back.

I think that is important, and when I have seen things like John Young's letter and statements of others closely associated with NASA in key positions, and not just in the astronaut corps, but people like yourself, other professionals. I think we owe it to NASA, and certainly to the people whose lives have been lost, but very particularly as well to the people who still work there and those who need to be enticed to come in and work and help us meet these new missions and goals, to make it clear that we are going to make sure that the facts are out on the table, and that we understand them clearly, and the responsibilities do end up being assigned somewhere. If procedures are wrong they are going to be fixed. If people have made bad judgments, those adjustments are going to be made, so that in the end everybody can operate with a degree of confidence that at least we are being honest with ourselves, and that we are getting to the truth and getting the truth

out, however painful that may be to do. And I just feel very strongly that we have not finished that as yet, and we cannot as yet, but it seems to me that that responsibility may in the end fall more to you than anybody else, and I can see some difficulties in that in the sense that you have been there before and you know a lot of the people, and so forth, and so I think it may impose a special burden at this time when confidence has to be restored, and problems have to be solved for you to step up to that. You may have to do a lot of things that certain people that you like a lot are not necessarily going to like or necessarily agree with, and I just hope that whatever is required, that you will do it, and my sense is that you are that kind of person, and you have had a very distinguished career, and there is really no point coming back if you are not going do to that. So I assume that is your intent, and I just wanted to share those thoughts with you at this point.

Dr. FLETCHER. Senator Riegle, just on behalf of NASA, that is my job. If I am confirmed, that is one of the first things I ought to do, because I was a little bit alarmed at some of the things that I read in the press. On the other hand, on a personal basis, I want to find out myself. I am curious as to just what went on during those times and what the procuedures were that led to the accident, and I think I owe it to myself, but I think I also owe it to the members of this committee.

Senator HOLLINGS. We have with our distinguished chairman a gentleman's agreement not to get into the shuttle accident itself, but as perhaps the Senator from Tennessee was emphasizing about an attitude toward cost, Senator Riegle is emphasizing an attitude toward responsibility, and the responsibility of the safety, and that is your responsibility. The Senator indicated that perhaps it is not any one single person. I do think it is one single person. I think that is your responsibility. There is no question about it. And let the record show that the distinguished administrator-designate pointed to himself.

Dr. FLETCHER. The buck stops here, Senator Hollings.

Senator HOLLINGS. Well, I appreciate it, and I am convinced that you are convinced of that, but I think that is an important point for us, because we cannot run any blooming program, and we can only keep it up with your aid. That is why I ask that you communicate with us, so we will know what we are all doing, and I think that in and of itself will help us reestablish this wonderful Space Program more quickly than anything else.

Thank you very much, Mr. Chairman.

Senator GORTON. Dr. Fletcher, I have a couple of other questions on NASA policies on a different subject which I reserved until this point. We have become so accustomed to acronyms, of course, that we sometimes forget what they stand for. NASA stands for the National Aeronautics and Space Administration, and aeronautics is a responsibility of NASA. I would like at least a brief reflection on your part as to what you consider the responsibility of NASA to be with respect to aeronautics, and with the seemingly declining edge which the United States has with respect to aeronautics.

Dr. FLETCHER. Mr. Chairman, I have a very biased view toward aeronautics, having been a member of the advisory committee to the NACA, I believe, in about 1950, and so I followed the NACA

part, which is the aeronautics part of NASA, for many years, and I believe you agree with me that a lot of the developments in both the military and the commercial aviation program in this country came out of that old NACA Program, and more recently out of the aeronautics part of NASA.

I think, however, the competitiveness of the aviation industry depends on a lot of factors in addition to the R&D that NASA does. Believe me, the R&D that NASA does will be pertinent to the problem of competitiveness of the U.S. aviation industry, and so we will do whatever we can. We have to, in all areas, the subsonic, supersonic, and more recently the hypersonic, as we used to call it, but the national aerospace plane.

Senator GORTON. That does lead to my final question. Senator Riegle in his questions asked you and you answered on the plans for an aerospace plane which simply assumed that we were going ahead with that project. I just want to give you an opportunity to make more explicit your views on that subject, and is it your view that that is a highly important future technology on which we should concentrate, at least with definitional studies, for the next couple of years, in a cooperative venture with NASA and the Department of Defense? Do you have that aerospace plane as roughly the same high priority that the President indicated in his State of the Union Address?

Dr. FLETCHER. Mr. Chairman, I am not familiar with all of the details of the national aerospace plane, but NASA has been working on hypersonic technology for a number of years, as you know, and the engine development that is planned for the national aerospace plane was primarily out of NASA and its contractors, and I think just by what little I do know that now is the time to put all of that technology together in an experimental airplane and fly it and see what the problems are in terms of—we used to call it hypersonic flight, but flight at 10,000 miles per hour or thereabouts. Yes, I do think that is a major thrust that this country should pursue at this time.

Senator GORTON. Dr. Fletcher, I thank you very much, and not just for being at this hearing this afternoon. I cannot remember which of my colleagues said that your willingness to take this job on again was a combination of dedication and patriotism. I think under the circumstances some may have said it was foolhardy, and if so, it is a foolhardiness which I believe will be of great service to the country.

I am sure we will see a good deal more of one another, you and the subcommittee, and I am delighted at this beginning.

Dr. FLETCHER. Thank you, Mr. Chairman.

[Whereupon, at 5:30 p.m., the committee was adjourned, to reconvene upon the call of the Chair.]

[The following information was subsequently received for the record:]

PREHEARING QUESTIONS OF THE MAJORITY AND THE ANSWERS

Question 1. NASA faces its most difficult challenge yet—reconstituting its space launch capability, maintaining an aggressive agenda of space science and applications activities, maintaining world leardership in aeronautical research and technol-

ogy, and moving forward with the space station program—all in the face of significant budget pressures that will likely continue for the next several years.

Having inherited this situation, how do you intend to lead NASA through these challenging times, and what priorities will you establish?

Answer. NASA's first priority is to restore the Nation's shuttle system to flight operations with the assurance that the system is safe. NASA has been engaged in an exhaustive review of the data from the Challenger and the shuttle program in general. I am confident that NASA, with its tradition of science, technology and engineering, will come out of this very difficult period a stronger agency.

The second priority is to maintain U.S. leadership in aeronautics and space, and I believe that this objective is well within NASA's capability. The President, the Congress and the American people are firmly behind the national space program, and NASA will strive to stay on the cutting edge of science and technology.

Question 2. In your opinion, what does NASA need most at this point, or what fundamental changes need to be considered for implementation? How do you intend to see that these needs are met and the appropriate changes are implemented?

Answer. I think it would be premature to comment on what changes may be required. I think it is best that we wait for the Presidential Commission's report.

I can assure you that NASA will take whatever steps are necessary to assure that it can fulfill the national space policy.

SPACE TRANSPORTATION

Question 3. Should NASA rely solely on the Space Shuttle for space transportation, or should NASA maintain a back-up ELV capability?

When you were Administrator during the development of the Shuttle, what concerns, if any, existed about relying on only one means of space transportation, the Space Shuttle?

Answer. It is clear that the Nation requires a mix of space launch capabilities. The proper mix of shuttle and ELV capabilities is under review. It is today premature to judge the extent of NASA's involvement in a backup ELV capability.

Question 4. The Senior Interagency Group (SIG) on Space is debating the issue of whether or not NASA should continue to launch commercial communications satellites from the Shuttle. What are your thoughts on this issue?

Answer. I believe that payloads that are shuttle unique must be taken to orbit by the shuttle. As to how many additional commercial payloads the shuttle should continue to launch, I think there are a number of factors that come into play: the issue of the backlog, the rate of reducing that backlog, the requirements of commercial customers to get into orbit, and the availability of competitive domestic launch services must be taken into account.

Question 5. How important is it that we have a commercial ELV industry, and what, if anything, should be done to ensure its viability.

Answer. I support the President's commercial space policy and if confirmed I will, to the best of my abilities, make sure that the opportunities to commercialize space are exploited fully in a timely fashion.

There must, sooner or later, be an opportunity for a domestic commercial ELV industry. I think the market should ultimately determine the risks and rewards of such a venture.

SPACE STATION

Question 6. NASA has requested funding for fiscal year 1987 to initiate development of a permanently manned space station in order to have an initial orbital capability by 1994. Is a permanently manned space station the appropriate next step in space, and if so, how important is it that NASA initiate development in fiscal year 1987 and achieve initial orbital capability by 1994?

Answer. In the decades following its initial operation, the Space Station will enable us to continue the exploration and use of space, an enterprise in which the United States traditionally has excelled. It will be our means to continued leadership in space, now challenged by the Soviet's recent launch of what will become their permanently manned space station. The Space Station is still the next logical step for our nation in the exploration and utilization of space.

It is essential to start Space Station development in FY 1987. Such a start will signal to our international partners that the U.S. commitment to Space Station is firm and that their own budgetary and intellectual resources can safely and productively be devoted to a cooperative Space Station Program. It will signal to the U.S. private sector that future investments in commercial space activities can be planned with confidence. Initiation of Space Station hardware development will signal to

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U.S. industry that the program is on track and that private investment of money and talent is justified. NASA, industry, and our international partners as well as others who anticipate using the Space Station are now poised to begin actual development. Much planning has been done. Substantial resources have been utilized toward proceeding with development in FY 1987.

Question 7. Our potential international space station partners have been emphatic about participating in the space station program as equal partners.

How do we balance our national technology transfer interest with our geopolitical interests?

Answer. Partnerships in international cooperative space projects are based on both sides' interest, and are constructed so that they bring appropriate benefits to both sides. In the case of Space Station, this means that the U.S. and its partners will all contribute elements to the construction of the Space Station, and in return share its utilization benefits in a proportional sense. Cooperation in the Space Station by no means implies the necessary transfer of any ability to use new technology in manufacturing and design work. In fact, all sides are interested in protecting their domestic technologies both in the design and development of Space Station and in its utilization.

Question 8. With a constrained future launch capability, it is expected that the Department of Defense will occupy a greater number of Shuttle missions than previously planned. Given this expectation, how would you respond to any allegations that NASA is losing its "civil" status and that space is becoming "militarized?"

How do you intend to maintain the distinction between the space activities of NASA and DOD?

Answer. National policy mandates the Shuttle as the primary launch system for national security as well as civil government missions, and specifies that national security missions will be given priority.

The demand for Shuttle launches has not changed as a result of the accident—only the supply of launches available as operations resume. NASA will fulfill pre-accident commitments as expeditiously as possible, and any apparent imbalance in the number of security and civil flights will be resolved over time as operations return to normal.

The distinction between NASA and DOD activities is prescribed in the National Aeronautics and Space Act, and we will, of course, adhere to that legislation.

Question 9. Do you believe that NASA has maintained the proper emphasis and direction as an R&D agency, or have the budgetary requirements of the Shuttle system diverted NASA from its chartered role as an R&D agency? What can or should be done to reaffirm NASA's thrust as an R&D agency?

Answer. NASA has carefully maintained a well balanced program, always keeping the long term goals of scientific and space exploration as highest priority in making program decisions during fiscally restrictive years. Over the last fifteen years, NASA has maintained an average of over 20% of its Research and Development and Space Flight and Control and Data Communications funding to Space Science and Applications activities. Major flight projects such as Space Telescope, Galileo, Ulysses, the Gamma Ray Observatory and the Upper Atmosphere Research Satellite have been initiated. Significant advances in computational capability have been achieved, culminating in the Numerical Aerodynamics Simulator (NAS) facility. The Aeronautics and Space Research and Technology programs continue to push forward in areas of basic research that provide an undergirding for future discoveries. The Space Station will be of great value to the advancement of space research. These program thrusts will be maintained in the future, which will insure that NASA's primary mission be in pursuit of exploring research and development frontiers.

Question 10. With the Challenger accident and growing budgetary pressures, the opportunities during the next few years for new starts in NASA's Space Science and Applications Programs may be quite limited. How can NASA maintain continuity and momentum in these programs, when many of them have been delayed for several years waiting for a new start approval?

Answer. We are making a major effort to understand the program alternatives available as we map a strategy for recovery of the space science and applications program. While we deal with the impact of the Challenger accident, we will attempt to maintain a vigorous level of activity during the hiatus. Our Space Science and Applications Program has sufficient breadth and momentum to permit a moderation of the impact on research resources and opportunities by using to the fullest extent our operating and various other elements of our research base programs.

About twenty earth-orbiting and solar system exploration spacecraft continue to provide high quality data that can support important research in many disciplines.

We will continue to ensure the broadest use of these ongoing missions. We will also work to maximize the use of our ground-based Research and Analysis programs to keep the space and earth siciences as vigorous as possible pending restoration of Shuttle flights.

With regard to future starts, we will continue to invest some resources for the definition of these projects. We will continue the development of advanced technologies and definition studies to validate mission concepts and to reduce technical uncertainties and risks encountered in the initiation of more technologically challenging flight projects. This effort will contribute to the maintenance of the science base for the longer term program as well as ensure technological readiness when conditions permit the initiation of new flight programs.

Question 11. The competitive edge of the United States in the world arena of aeronautical technology and sales has narrowed considerably over the past several years. What can NASA do to reestablish a more competitive margin in aeronautical technology and sales?

Answer. Pioneering new technology is the highest leverage for securing lasting U.S. competitiveness. Though technology superiority alone will not guarantee U.S. preeminence, the lack of technical comparability will assure its loss. In this regard, NASA must continue to conduct an aggressive long-range R&T program that concentrates on emerging technologies with potential for order-of-magnitude gains and exploits key vehicle opportunities. This holds the greatest promise for maintaining U.S. preeminence in the world market.

In aeronautics, NASA plays a unique central role in providing a timely, proven, and broad technology base for U.S. industry application. Product innovation and development by the industry stemming from an enhanced base of new technology can provide a wide margin of technical superiority, potentially offsetting the non-technological advantages foreign manufacturers enjoy.

Question 12. With this thought in mind, do you think that over the past several years NASA's aeronautical R&D budget, which is now approximately $350 million, has reflected an appropriate level of priority with the Agency?

Answer. Yes, within a constrained NASA budget, the aeronautics programs has competed effectively with other agency priorities and has remained strong and productive over the past several years. In the Agency's FY 1987 budget request for example, which was level from FY 1986, the Aeronautics program grew by 6.2 percent. This growth is approximately 19 percent with the National Aerospace Plane initiative. I believe this emphasis is appropriate. The results of the NASA program can be found in all of the latest civil and military aircraft, and the research results rapidly emerging from NASA laboratories will have profound significance for the future of aviation.

NASA has played a major role in establishing and maintaining U.S. leadership in aeronautics. I have a strong commitment to continuing this central role in the successful U.S. aeronautics partnership. Given the vast opportunities and associated payoff of NASA's long-range research, I am sure that the aeronautics program will continue to compete effectively for resources even in a constrained fiscal environment.

Question 13. NASA's fiscal year 1987 budget request, along with the budget request of DOD, initiates a study effort to define the relevant technologies for an Aerospace plane. What priority do you believe the National Aerospace Plane Program should have as a part of NASA's agenda for the next decade? How do you view such a vehicle, if developed, in the context of NASA's future space transportation system?

Answer. The joint NASA/DOD National Aerospace Plane Program (NASP) is currently in a "technology development" Phase (2). This is an aggressive, focused, three to four year activity directed at critical technologies in airbreathing propulsion, high temperature materials and structures, applied computational methods, aerothermodynamics and propulsion/airframe integration. These technologies are required for the design of X-type flight research vehicle that would be fabricated and flight tested, in a Phase 3 activity, in the middle of the next decade. The program is technically demanding and requires the concentrated efforts of the NASA and DOD laboratories, facilities, and technical staffs, as well as the major propulsion and airframe industrial contractors. Consistent with the President's goal, the National Aerospace Plane Program should be given high priority for the next decade.

An operational Aerospace Plane is conceivable in the first decade after the turn of the century. Advanced military vehicles, civil applications, such as hypersonic cruise aircraft, and future space transportation single-stage to orbit vehicles would all have the pedigree of technology developed in the NASP program.

NASA space transportation requirements in the post-Shuttle era are in two major categories: 1) heavy lift and cargo and 2) personnel and/or high priority payloads. The Aerospace Plane could very well satisfy the second requirement and offer the potential for a significant reduction in operational costs, the flexibility of a variety of launch and recovery sites, and autonomy from ground control while in flight. Many of the technologies developed such as high temperature materials, reusable thermal structures, and advanced control systems in this program will have direct benefit to next generation rocket launch vehicles also.

Question 14. While the concept of space commercialization probably did not receive much attention during your first term as NASA Administrator, it has now captured the attention of most of the aerospace industry, along with a noticeable section of the financial and nonaerospace business community. What do you believe is NASA's appropriate role in the commercial development of space, and to what extent should NASA actively promote space commercialization?

Answer. I believe NASA should actively facilitate private sector investment and involvement in space. The National Space Policy of 1982 established as one of the goals of the Reagan Administration's civil space program, attracting new commercial activities along with substantial increases in private investment in space. A series of presidential and congressional actions and announcements have subsequently reemphasized and supported this objective. Most recently, the 1985 NASA Authorization Act directed NASA to "... seek and encourage to the maximum extent possible, the fullest commercial use of space." In explaining the intent of that language, the House Committee on Science and Technology encouraged NASA to "... aggressively pursue all areas of potential commercialization." NASA currently is doing that through its Office of Commercial Programs, established in 1984. Through its various programs, this Office is actively seeking to reduce the technical, financial, and institutional risks of commercial space ventures to levels competitive with conventional investments. The Office of Commercial Programs (OCP) uses various means to accomplish this goal. NASA offers flight aboard the Shuttle in exchange for data on experimental payloads with commercial potential. OCP's research and development enhancement program creates generic hardware and facilities which may be used by private sector for research. Newly established Centers for Commercial Development of Space are consortia of industry, academia, and Government. NASA assists with their inception and supports them for five years after which they will be self-supporting. NASA hopes to combine the efforts of private companies and academic institutions to speed commercial applications of space research.

Because of its strong mandate, NASA is developing an outreach effort to stimulate new commercial ventures apart from direct NASA funding.

U.S. SENATE,
Washington, DC, April 25, 1986

DR. JAMES FLETCHER,
Old Executive Office Building,
Washington, DC.

DEAR DR. FLETCHER: In accordance with our agreement made during your confirmation hearing on April 23, I am presenting the following questions to you that were raised by the article in the April 23, 1986, edition of the New York Times.

I would reiterate that I am willing to believe that there could be mis-statements of fact in the article, and that it is possible that a different perspective could alter the image created by the piece.

My questions are as follows:

Question 1. The article states, "In 1972, Dr. Fletcher predicted in news releases and Congressional testimony, a cost of $10.45 million for each shuttle launching. The General Accounting Office said then that the figure was 'misleading', and 'overly optimistic' since it accounted for only operating, not construction, costs and did not reflect considerable technical uncertainties."

"Today the costs are $279 million for each launching, including construction and operations, and $151 million each time just for operations, according to Congressional Budget Office figures. Even after discounting for inflation, today's operations cost alone for each launching is five times the original projections. The original NASA projections said the shuttle would be uneconomical if launching costs rose more than 75 percent."

Did you represent those costs to Congress, and on what basis did you project those costs?

Do you disagree with the present costs as represented in the article?

Did you know of the General Accounting Office's disagreement with your cost projections? Did you disagree with them, and if so, why?

How do you account for the great disparity between your cost projections and the ultimate actual costs?

Question 2. The article also states "Dr. Fletcher predicted, too, that the cost of lifting shuttle cargo into orbit would be $100 a pound. The cost now is $5,264 a pound for the total program and $2,849 a pound for operations alone. Discounting for inflation the corresponding rise is 9 to 19 times, Congressional Budget Office figures showed."

Did you make such estimates of the cost of cargo charges at that time? On what basis?

Do you disagree with the figures quoted in the article?

How do you explain the disparity between your projections and the actual present costs?

Question 3. The article states "In letters to Congressional auditors, Dr. Fletcher and his deputies consistently refused to correct many of the problems cited by the inspectors, including management errors, spending abuses, delays in hardware testing, lax monitoring of contractors and optimistic estimates of cost and technical problems."

Were such allegations and criticisms made of NASA during your tenure?

Did you take exception to those suggestions, and if so, why.

Question 4. The article states that on April 6, 1977, Dr. Fletcher wrote to the General Accounting Office "Cost effectiveness was a central feature in the initial approval for the shuttle, and remains so. On a payload cost basis, the shuttle is the most economical space transportation system." The previous year, he cited the "past excellent NASA record for on-time within cost program accomplishment on major manned missions."

Assuming you made such a statement, how do you resolve the disparity in your description of an "excellent" NASA record with one that was repeatedly criticized by the General Accounting Office. You were later quoted in the article that you were in a "running battle with the G.A.O.", and characterized the different evaluations as differences of judgement. Specifically, how did your judgement and approach to management differ with the GAO?

Question 5. You were also quoted as saying "In retrospect, maybe we were optimistic. The cost per flight rose way beyond what we anticipated. We're all disappointed it didn't come out the way we calculated." Specifically, what costs rose, and precisely what were the errors in your calculations? Did you realize these errors while you were still at the agency, and if so, did you make those known to the Congress?

Question 6. The article also paraphrases you as having said that the cause of the problems at the agency was that NASA was "under severe budget restraints and asserted that most of the problems with the shuttle occurred after he left the agency"?

Please describe the budget constraints specifically. How much money do you believe was needed, and what was the shortfall? Specifically, how did those budget constraints lead to the aforementioned problems?

What problems occurred while you were at the agency, and what major problems occurred after your departure?

Question 7. The article states "In 1977, the G.A.O. said NASA, unlike the Pentagon, had not determined for Congress what cost increased resulted from inflation, what came from changes in the size of a project or what came from technical problems."

Do you dispute this statement? Could NASA distinguish between varying contributing causes to cost overruns?

If NASA could not distinguish between contributing causes, why not?

Question 8. The article also quoted a veteran GAO auditor whose experience in auditing NASA dates back to your previous tenure, stated that NASA was slow to provide material to auditors, citing a management philosophy wherein "they (NASA) want to provide a minimum of information, and it takes a great deal of effort to get the records we need".

Given that you also stated that there was a "running battle" with the General Accounting Office, was this a management philosophy of NASA's?

Question 9. The article also states that "From 1975 until 1981, NASA, in violation of its own contract and Federal codes, allowed Rockwell to buy part on the open market when millions of dollars of identical parts were available much cheaper from Federal sources, the auditors said." This lead to outrageously high charges for relatively inexpensive parts.

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Do you dispute the fact that Rockwell was not required to buy the parts from Federal sources? If not, do you dispute that this was a violation of NASA and Federal procurement regulations?

What is your explanation for not having required that Rockwell be required to adhere to the same cost saving policies as any other Federal contractor?

I appreciate your cooperation, and look forward to your candid responses to my questions.

Sincerely,

ALBERT GORE, Jr.,
U.S. Senator.

APRIL 28, 1986.

Hon. ALBERT GORE, Jr.,
U.S. Senate,
Washington, DC.

DEAR SENATOR GORE: This letter addresses the questions you raised during my confirmation hearing on April 23 and in your letter to me of April 25.

Answer 1. The primary purpose of the Shuttle was to develop the capability required for routine and cost effective access of people and equipment to and from space to achieve the benefits of the scientific, civil and military uses that will be important in decades to come to maintain world leadership. The figure of $10.45 million (in 1971 dollars) was only for our projection, at the start of the program, of the average operating costs over a twelve year operational period. It is my understanding that NASA completed development of the Shuttle generally along the lines originally prescribed, with some configuration changes; however, that the projected costs of operations, if calculated on the same basis as the original projection, have risen to about four times the original estimate (about $40 million per flight in 1971 dollars). The comparison in the New York Times article grossly overstates the increase because it compares costs for one year in the early part of the flight program with the original projected average for all missions to be flown over a twelve year period and because it includes amortization of development costs and imputed interest costs which were never intended to be included in the initial projections.

The Shuttle is at present the only means of transporting women, men and equipment to and from space, but even though justification of the Space Shuttle was not based on the details of Shuttle economics alone, all of us wish that it had been possible to meet the early operations cost goals. My understanding is that the increase has been attributable in about equal portions to the decrease in projected flight rates and to other factors. We did have some disagreements with the General Accounting Office (GAO) on NASA's cost projections and, as I remember it, no independent cost estimates were made by the GAO. These disagreements related primarily to the design uncertainties and the assumptions on flight rate. There never was an attempt to "mislead anyone on the cost aspect of the Shuttle" and NASA took the cost objectives seriously.

Answer 2. Although the figure of $100 per pound was used as a goal in the early phases of the Shuttle definition activity, my memory is that the information I presented was primarily in terms of cost per mission. The projected cost of $10.45 million per mission would result in a cost of about $160 per pound if the Shuttle were fully loaded in terms of weight carrying capacity. The figures in the news article appear to be based on the cost per flight amounts cited in question #1 and are substantially overstated for the same reasons.

Answer 3. It is my impression based on many discussions with GAO auditors and Mr. Elmer Staats, the then Comptroller General, that NASA did agree to correct most of the problems raised over the years 1971-1977. However, there remained some issues on which there was an honest difference in engineering or management judgment to which we responded to the GAO in writing. I am not aware of any such disagreements that could have led to charges that we "consistently refused" to correct problems.

Answer 4. In reviewing the programs of NASA, or any other agency, the function of the General Accounting Office is to identify problem areas and to recommend improvements. The fact that the reports contain primarily criticisms of the agency's activities reflects the nature of the audit function, not an assessment of agency performance. The agency has responsibility for considering and responding to these recommendations. In many cases the agency will agree with the GAO recommendation and take the action recommended. In other cases for reasons of engineering or management judgment on specific issues, the agency may disagree. This should not be viewed as indicating disagreements on basic management philosophy, nor on the need for effective management direction and control, but rather a difference of judg-

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ment on specific issues. We generally were provided an opportunity to comment on the GAO studies and I used these occasions to express agreement or disagreement with their findings. One example which comes to mind involves the timing of production of orbiters. The GAO recommended that we delay start of production of the last three orbiters until after the initial flight tests of the first two orbiters. In our view such an approach might be appropriate for a program with a distinct design, development, test and evaluation phase followed by a large production run; however, for a program such as Shuttle involving only a small number of vehicles and a gradual evolution from the initial experimental flights toward an operational capability, we did not believe that approach to be appropriate. Our judgment on this matter was clearly explained in a letter to the GAO.

Answer 5. The early projections of Shuttle flight costs, made at the beginning of the program before the Shuttle began flying depended on a number of assumptions. To the best of my knowledge there were no errors made in the calculations themselves regarding cost per flight. However, since apparently a number of the assumptions were not borne out in actual flight experience, actual experience did not correspond to the earlier projections. It should be noted that when I left the agency the estimated cost had risen about 20 percent and it is my impression that this increase was made known to the Congress.

Answer 6. In the early years of the Shuttle program some reductions were made in our budget requests which caused delay of some of the early design and technology effort. These reductions were significant relative to the amount requested at that time, about 10-15 percent in FY 1974 and 1975 as I remember it. Our request was also reduced by $160 million in FY 1977. One result was that we were not able to move as rapidly as we had hoped into development effort on the main engine, which involved some of the most challenging technology in the entire Shuttle system. Budget restraints force judgments to be made between the desirability of specific proposed activities and the overall cost constraints. This situation can be disruptive to a complex technological development program with a large number of closely interrelated systems which must progress toward flight readiness in a carefully coordinated manner.

Answer 7. I do not recall the GAO statement that NASA was unable to distinguish between increases caused by inflation or increases resulting from technical changes referred to in the question; it may have been made after I left. However, I disagree with it. During my tenure as Administrator, NASA could and did distinguish between cost increases caused by inflation and those related to other factors.

Answer 8. My philosophy as Administrator was to utilize auditing as an important management tool. As I recall, we maintained an independent internal auditing staff of several dozen people. In addition, we cooperated with the GAO, which in fact had fairly sizeable numbers of GAO auditors in residence at NASA during my tenure. As I mentioned in my answer to question #4 I can remember at least one major disagreement with GAO regarding the size of the initial orbiter procurement. Apart from that, there were, of course, a number of smaller issues on which GAO and NASA disagreed. My general approach was to work constructively with GAO and its personnel.

Answer 9. I was, and am, unaware of any Rockwell procurements made during my term as Administrator that were in violation of government procurement regulations. Had I been aware of such practices, I would not have permitted them to continue.

I look forward to meeting with you to discuss further areas of mutual concern.

Sincerely,

JAMES C. FLETCHER.

STATEMENT OF HON. JOHN WARNER, U.S. SENATOR FROM VIRGINIA

I am pleased to support the nomination of Dr. James C. Fletcher. Dr. Fletcher has been nominated by the President to serve as the Administrator of the National Aeronautics and Space Administration. At a time when this important agency is at the most critical stage in its history, strong leadership is vitally important. I am proud that Dr. Fletcher, an adopted Virginian has stepped in to accept this responsibility.

The exploration of Space is man's final frontier, and it falls to the National Aeronautics and Space Administration to provide leadership in America's space effort. Under NASA's leadership, America has led the world into the space age with accomplishment after accomplishment that can only be described as awesome.

The recent tragedy of the space shuttle Challenger and the loss of seven brave astronauts has brought to light the complexity and the danger of NASA's mission.

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However, it is my expectation that under the leadership of Jim Fletcher these complex problems will be solved in a manner that will allow the United States of America to retain our position of world leadership in the exploration of space.

[From the Miami Herald Mar. 16, 1986]

NASA Is Wasting Millions, Audits Reveal

[By Susan Sachs and Peter Cary]

The National Aeronautics and Space Administration has wasted millions of dollars in its dealings with contractors that built the space shuttle, audits examined by The Herald reveal.

The agency paid $315 each for wire fasteners that should cost three cents, audits show. It spent $159,000 for a cooling fan that was built for $5,000. It is paying a contractor $6.3 million to lease warehouses next to similar government buildings that are vacant. It paid $256 to fly an executive's pet dogs from coast to coast.

The waste becomes significant in the light of recent disclosures by NASA that it cut back on its safety staff, slashed shuttle reliability programs, and abandoned backup safety features. NASA officials say they made the cuts because there wasn't enough money.

George Spanton, a former Defense Contract Audit Agency supervisor of contractor billings at Kennedy Space Center, estimates that one-third of NASA's budget is fat. The money wasted on loafing work crews, excessive markups on parts, and freeloading contractors rivals the worst of the military, he said.

"I would say it's in the same ballpark as the [Pentagon's], which is about one-third," he said.

"That's a ludicrous statement," responded Richard L. Bankowski, NASA's director of procurement policy. "Over the years, we've proved that we've done a very efficient job."

Bankowski said he "wouldn't even attempt" to estimate NASA's waste. "I don't have any feel for what the problem is," he said.

But dozens of NASA and DCAA audits obtained by The Herald under the Freedom of Information Act show what the problems are.

Because contractors are allowed to recover related business expenses and overhead. NASA gets billed for fancy oak furniture, beachfront condos, self-serving promotions and charity contributions. Often the agency pays.

The potential for abuse is great because NASA spends nearly 90 percent of its budget—or $8.3 billion last year—on contracts with private companies.

United Space Boosters Inc., which builds part of the shuttle's rocket boosters, even wanted reimbursement for its $186,000 bidding costs on another NASA contract it didn't get.

NASA officials and the contractors they supervise work side by side for years, making for a cozy relationship, according to auditors.

When Rockwell employees at Johnson Space Center were found playing cards on the job and wasting one-third of their work-days, auditors said they weren't sure if the problem was overstaffing or "excessive loafing." Yet NASA officials at the center ignored suggestions that the company's million-dollar bonuses be withheld until the "inefficiencies" were corrected.

Auditors can sample only some of the hundreds of thousands of items suppiled to the shuttle so excessive prices can go undetected. In one sample, though, they found a high-stress bolt that NASA could have bought through a central federal supply system for $126. The contractor was charging $3,166.

When Rockwell sent 448 employees from California to Kennedy Space Center in 1980, the travel bills submitted to NASA shocked even seasoned DCAA auditors.

Rockwell wanted reimbursement for $52,000 in travel costs for seven executives' families, including a $389 plane ticket so a company stepson could visit his natural father, $256 in airfare for an executive's pets, and the $1,000-a-month rent on a beach-front condo for a Rockwell vice president and his "companion."

Nine out of 10 Rockwell workers had rental cars in Florida, all charged to NASA. Auditors said half the workers drove more than 2,000 miles a month and charged NASA for gasoline, although they were staying at hotels only 16 miles from work.

Rockwell spouses drove rental cars, even when the employee had a rental car too. Some employees drove their own cars to Florida, charging for mileage and per diem on the coast-to-coast trip, and then rented additional cars at Kennedy.

DCAA auditors icily described the charges as excessive, unnecessary and unreasonable. The company, they said, has "lived too long in an environment in which almost all costs have been passed on to the federal government."

Rockwell said its travel policies were good for morale and eased family tensions. "Laudable objectives," the DCAA said, but taxpayers shouldn't bear the cost. The auditors urged NASA to disallow $1.5 million of Rockwell's $1.8 million bill.

But shuttle contract supervisors at NASA's Johnson Space Center sided with Rockwell. They said the entire travel bill should be paid or, at the most, $72,000 should be disallowed.

Three years later, in 1983, the parties settled. Only $252,000—one-sixth the amount recommended by auditors—was disallowed.

OPEN-ENDED CONTRACTS

Aerospace companies get away with some of these charges because many NASA contracts are open-ended and permit contractors to recover overhead costs.

Those charges, auditors said, can be a fertile area for abuse.

Take Rockwell's $730 million contract to provide spare parts for the orbiter. The shuttle has been chronically short of new parts, sometimes forcing NASA to repair and reuse damaged equipment.

But auditors found NASA wasted money by paying huge markups on some parts bought from Rockwell, instead of buying the aircraft-quality nuts, bolts and washers at low prices through the government's bulk supply system.

For some common parts, Rockwell's Rocketdyne Division paid its subcontractors up to 78 times the price offered by the government's supply system. Rocketdyne then sold the same parts to NASA for a price that was 3,000 times higher than the government's price.

A one-inch wire-end terminal could have been bought from the supply system for three cents. The terminal Rockwell bought from its subcontractor for 10 cents was sold to NASA for $315.

Rockwell told auditors that its parts prices include special tooling and setup charges and production costs.

In another example, auditors said a space shuttle cooling fan cost $5,215 in parts and labor to fabricate. The manufacturer added $68,785 in overhead and fees. A middleman contractor added $85,000 more when it sold it to Rockwell for NASA. The cost to NASA was $159,000.

NASA managers defended the cost, saying the fan was bought at the start of the shuttle program when every part needed rigorous testing. Auditors said the middleman "essentially provided no services" for its $85,000 fee.

From 1975 to 1981, NASA officials didn't force Rockwell to try to buy spares from the less expensive system, as required in its contract. From 1981 to 1984, NASA softened the contract requirement. Only after a critical audit did the agency begin to require Rockwell to seek the cheapest orbiter parts.

Saving money wasn't a consideration when contract monitors at NASA's Marshall Space Flight Center allowed booster rocket manufacturer Morton Thiokol to rent privately owned buildings for $6.3 million.

NASA can be charged for $3.1 million of the rents and for $3 million in improvements to the Clearfield, Utah, buildings. One of the buildings had only recently been sold to Thiokol's landlord by the government. At that time, it had been valued at $300,000.

NASA officials approved the leases, even though Thiokol could have used empty, government surplus buildings in the same complex.

In 1982, auditors found that Marshall officials often failed to get required monthly progress reports from contractors.

In one instance, they also didn't hold a preliminary design review with Harris Corp. until 13 months into a 22-month contract to design and build a new computer system. When the review was finally held, the NASA officials realized they didn't need the design. But they had already paid out $1.2 million of the $1.7 million contract.

Historian Arnold Levine, who has written extensively about NASA, noted that for years, Congress and the White House "gave NASA as much of a blank check as any agency." NASA has returned the favor.

In the first two years of the shuttle program, for example, it spent $1.5 million to bring 2,228 guests to Florida to watch shuttle launches. Eighty-two percent were government employees and their spouses. One-fourth were members of Congress and their staffs.

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RAMPANT COST OVERRUNS

While congressional criticism of NASA spending practices has been rare, cost overruns sometimes get too big to ignore.

Last summer the General Accounting Office said the $500 million Centaur project, to adapt a liquid-fueled rocket to ride in the shuttle, was $140 million over budget, $120 million more than the previous year's estimate.

"General Dynamics had swept [overruns] under the rug," then NASA Administrator James Beggs told a Congressional subcommittee. "There were problems in their subcontracts that they had known about, but that they had not owned up to, and there were problems in their own shops."

One problem: the company built fuel tanks that cracked under pressure. A company executive admitted the tanks weren't built to specifications; Beggs admitted that NASA didn't watch the company.

Beggs came to NASA from General Dynamics, where he was an executive vice-president from 1974 to 1981. During his tenure at NASA, the company won contracts worth nearly $1 billion.

He resigned two weeks ago and is awaiting trial on federal charges that he and three other General Dynamic executives conspired to falsify billings to the Defense Department in the late 1970's. Beggs has denied the charges

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION,
Washington, DC, April 21, 1986.

DAVID H. MARTIN, Esq.,
Director, Office of Government Ethics,
Washington, DC.

DEAR MR. CHAIRMAN: Based upon an examination of the Financial Disclosure Report (SF-278) of Dr. Fletcher, and his April 17, 1986 letter to me, it is my opinion that Dr. Fletcher has no financial or other interests that constitute a conflict of interest, create the appearance of a conflict of interest, or have the potential of giving rise to a conflict of interest under relevant statutes, Executive Orders or NASA regulations.

The handling of the deferred income for work already performed by Dr. Fletcher regarding Amoco Corporation, Burroughs Corporation and Fairchild Industries has been worked out in the following manner. The Fairchild Industries deferred income will be fully paid to Dr. Fletcher before he becomes Administrator of the National Aeronautics and Space Administration (NASA) or shortly thereafter. He will recuse himself from dealing with matters directly affecting Fairchild until such income has been received by him. Regarding Burroughs Corporation, if a matter that could directly affect this company should come before him, a decision will be made as to whether he should recuse himself or a (b) (1) exemption to 18 U.S.C. 208(a) will be sought. He will recuse himself from all matters that could directly affect the Amoco Corporation. Dr. Fletcher's letter of April 17, 1986 further notes all the actions he will take upon confirmation of his appointment as the Administrator of NASA.

Therefore, I know of no barriers for Dr. Fletcher serving as the Administrator of NASA if he were to be confirmed by the Senate.

Sincerely,

JOHN E. O'BRIEN,
General Counsel.

Enclosure

APRIL 17, 1986.

Mr. JOHN E. O'BRIEN,
General Counsel, National Aeronautics and Space Administration, Washington, DC.

DEAR JACK: This letter is to aid you in understanding some of my entries on my Financial Disclosure Report and to declare my intentions as to how I propose to address possible conflicts of interest with my duties as NASA Administrator.

In regards to the investments listed on Schedule A for which there could be an appearance of a conflict, I propose to take the following actions upon confirmation of my appointment as Administrator of the National Aeronautics and Space Administration:

Schedule A

Burroughs Corporation—divestiture of my holdings.
Amoco Corporation—disqualification from any involvement with Amoco.
Astrotech International—divestiture of my holdings.
Fairchild Industries—divestiture of my holdings.

Southern California Edison—disqualification from any involvement with the company.

Cleveland Electric Corporation Illuminating—disqualification from any involvement with the company.

New York Telephone—disqualification from any involvement with the company.

Pacific Gas & Electric—disqualification from any involvement with the company.

University of Pittsburgh—disqualification from any involvement with this university.

As you know, I am a Director on the Boards of Amoco, Burroughs, Comarco, Fairchild, Astrotech International and the General Space Corporation. When confirmed by the Senate, I will immediately resign from these Boards (see page 8).

Upon confirmation by the Senate, I will also terminate any consulting activities done in my own name or those done with or for James C. Fletcher and Associates, Inc.

As stated previously, I will not accept Board Director's fees subsequent to the date of my confirmation. In regard to the "deferred Board fees" from Amoco and Fairchild, I propose to have only those fees earned prior to my confirmation date paid to me in accordance with the deferred payment plans established by the corporations. As long as I continue to have funds in these plans, I will recuse myself from matters pertaining to these corporations. With respect to Burroughs, I will receive no deferred Board fees while I am employed by NASA. In addition, upon confirmation I will obtain a surety bond which will insure the payment of these fees to me after termination of my government employment regardless of the financial condition of Burroughs. Therefore, I will have only a very tenuous economic interest in Burroughs. Should a situation arise which requires me to address an issue relating to Burroughs, I will either recuse myself or request a waiver of that limited interest under 18 USC Section 208 (b)(1).

I presently receive a pension from Aerojet General. This pension is fully vested and I have no other financial interests in Aerojet General. I understand that my interest in this pension will not require my recusal from taking official actions regarding Aerojet as NASA Administrator in accordance with the provisions of the NASA Standards of Conduct (Appendix B, par. 4, 14 CFR Part 1207).

As stated on this schedule, I will enter into an agreement with the University of Pittsburgh to take a leave of absence while serving as Aministrator.

Schedule D

In my previous remarks I have addressed those entries in Parts I and II on page 1 of Schedule D

On page 2, Schedule D, I previously addressed those entries other than my consulting activities with General Public Utilities, LTV, Inc. and the Institute for Defense Analyses. I will, of course, terminate my activites with these companies upon confirmation of my nomination.

In regard to those entries on pages 3 and 4 of Schedule D, upon Senate confirmation I will resign from membership on the Pan American Airways International Advisory Board, the Governing Board of the University Corporation for Atmospheric Research, the National Advisory Committee of the Gas Research Institute, the Governing Board of the Argonne National Laboratory, the Visiting Committee of the Stanford University School of Engineering, and the Space Studies Institute to avoid the appearance of any conflict of interests.

In addition, although these positions are unlikely to create any real or potential conflict, I propose to resign from all of the other positions listed on Schedule D, including the following: board member or trustee with the National Space Society, Wernher von Braun Memorial Foundation, and the National Research Council Commission on Physical Sciences, Mathematics and Resources.

I am aware that the System Development Corporation is a subsidiary of the Burroughs Corporation. Consequently, until I have divested my Burroughs holdings, I will disqualify myself from any matters pertaining to the system Development Corporation. To further avoid any appearance of any conflict of interest during my tenure as Administrator, should I be confirmed, I will also disqualify myself from any matters pertaining to Astrotech International Corporation and General Space Corporation.

As stated previously, this letter is intended to declare my intentions regarding the disposition of my assets and those matters requiring recusal on my part once I assume the duties of NASA Administrator. If you need any additional information or if you have any questions, please feel free to contact me.

Sincerely,

JAMES C. FLETCHER.

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